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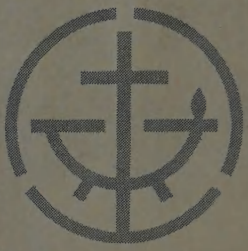

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MIND-ENERGY

LECTURES AND ESSAYS

BY

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TRANSLATOR'S PREFACE

THIS volume of Lectures and Essays is an English edition of *L'Energie spirituelle*. It is not simply an approved and authorized translation, for M. Bergson has gone carefully with me into details of meaning and expression in order to give it the same authority as the original French.

The separate articles here collected and selected are, partly lectures in exposition of philosophical theory, partly detailed psychological investigation and metaphysical research. The publication of the volume was in preparation when the war broke out and interrupted the work. The principle on which the articles are selected is indicated in the title, Mind-Energy. They are chosen by M. Bergson with the view of illustrating his concept that reality is fundamentally a spiritual activity. A second series is to follow illustrating his theory of philosophic method.

The subject title, Mind-Energy, will recall the title, Mind-Stuff, which W. K. Clifford in a lecture many years ago employed to denote a new theory of consciousness. Since that day a change almost amounting to a revolution has overtaken the general concept

333156

of the nature of physical reality. This is due to the development of the electro-magnetic theory of matter. In modern physics we may say that the old concept of stuff has been completely displaced by the new concept of radiant energy. An analogous change has gradually meanwhile pervaded the whole science of psychology. In recent years we have witnessed the opening up of a new and long-unsuspected realm of fact to scientific investigation, the unconscious mind. The very term seemed to the older philosophy to imply a latent contradiction, today it is a simple general description of recognized phenomena. Just as a dynamic concept of physical reality has replaced the older static concept in the mathematical sciences, and as this has long found expression in the term energy, so a dynamic concept of psychical reality has replaced the older concept of mind which identified it with awareness or consciousness, and the physical analogy suggests energy as the most expressive term for it. In affirming Mind-Energy the intention is not to include the activity of mind in the system of radiant energy which constitutes the science of physics. On the contrary, what is intended is that the science of mind, quite as much as the science of matter, can only be constituted by means of a concept which allows of the formulation of a law of conservation. Mind is not a phenomenon which flares up out of nothing and relapses into nothing, it can only be understood when it is conceived as

a continuity of existence, and it can only be conceived as a continuity of existence when its actuality is correlated with its virtuality. Or, to express this in terms more consonant with the method of philosophy, the special phenomena which are manifestations of mind can only be systematized as a science of mind when they are interpreted as the expression of an activity. Activity seeking expression is the concept of Mind-Energy.

But although the term Mind-Energy does not, and is not intended to, imply a physical concept of mind, yet it is meant to imply, and it does depend upon, a metaphysical concept. Mind is not a *vis vitae* convertible into a *vis inertiae*. Equally impossible is it to conceive an ultimate dualism,— mind and matter as the co-existence of two independent realms of reality. Mind and matter are divergent tendencies; they point to an original and necessary dichotomy; they are opposite in direction; but they are mutually complementary and imply the unity of an original impulse. The new concept therefore is of a reality with which life and consciousness are identical, as distinct from the concept of a reality independent of life and conditioning it, and upon which it depends. This new concept in its turn suggests a new working principle in the biological and psychological sciences. The principle is that the great factor in evolution is a kind of unconsciousness. Such unconsciousness, however, is not

a primitive self-sufficient principle. It is not an Absolute, as some metaphysicians have held. It is, on the contrary, a restriction of the consciousness which life possesses in right, a restriction contrived by life in order to fashion the instrumentality of efficient action. So that while the philosophical problem of the past has been to define the nature of consciousness, explain its genesis, and determine its relation to the external reality inferred as conditioning it, the philosophical problem before us today, if we accept the new concept, is to explain the nature and genesis of unconsciousness.

H. W. C.

CONTENTS

PAGE

TRANSLATOR'S PREFACE v

I LIFE AND CONSCIOUSNESS 3

The great problems — Philosophical systems — *Lines of facts* — Consciousness, memory, anticipation — What beings are conscious? — The faculty of choosing — Consciousness awake and consciousness slumbering — Consciousness and unforeseeability — The mechanism of free action — The tensions of duration — The evolution of life — Man — The creative activity — The meaning of joy — The moral life — The social life — The beyond.

II THE SOUL AND THE BODY 37

The common-sense theory — The materialist theory — Their shortcoming — The metaphysical origin of the hypothesis of a parallelism or equivalence between cerebral activity and mental activity — The appeal to experience — The probable rôle of the brain — Thought and pantomime — *Attention to life* — Distraction and alienation — Theory suggested by the study of memory, especially word-memory — Where are memories preserved? — Does the soul survive the body?

III "PHANTASMS OF THE LIVING" AND PSYCHICAL RESEARCH . . 75

The prejudice against "psychical research" — Telepathy and science — Telepathy and coincidence — Character of modern science — Objections against psychical research in the name of science — The metaphysics implied in the objections — What a direct study of mental activity might yield — Consciousness and materiality — Future of psychical research.

IV DREAMS 104

The part which visual, auditive, tactile, and other sensations play in dreams — The part which memory plays — Is

PAGE

the dream creative? — The mechanism of perception in the dream state and in the awake state: analogies and differences — The psychical character of sleep — Disinterestedness and detension — The state of tension.

V MEMORY OF THE PRESENT AND FALSE RECOGNITION . . . 134

False recognition described — Distinguished from: (1) certain pathological states; (2) vague or uncertain recognition — Three systems of explanation, according to whether the trouble is regarded as affecting thought, feeling or volition — The theories criticized — A principle of explanation proposed for a wide class of psychical disorders — How memory is formed — Memory of the present — The duplication of the present in perception and memory — Why this duplication is normally unconscious — In what way it may become conscious.— Effect of an "inattention to life"— Insufficiency of *impetus*.

VI INTELLECTUAL EFFORT 186

What is the intellectual characteristic of intellectual effort? — The different *planes of consciousness* and the movement of the mind in traversing them — Analysis of the effort to remember: instantaneous recall and laborious recall — Analysis of the effort of intellection: mechanical interpretation and attentive interpretation — Analysis of the effort of invention: the scheme, the images and their reciprocal adaptation — Results of effort — The metaphysical bearing of the problem.

VII BRAIN AND THOUGHT: A PHILOSOPHICAL ILLUSION 231

The doctrine of an equivalence between the cerebral and the mental — Can it be translated either into the language of idealism or into that of realism? — The idealist expression of the theory avoids contradiction only by an unconscious lapse into realism — The realist expression only escapes contradiction by an unconscious lapse into idealism — The mind oscillates continually and unconsciously between idealism and realism — The fundamental illusion is continually reinforced by complementary and dependent illusions.

INDEX 257

MIND-ENERGY

I

LIFE AND CONSCIOUSNESS

The Huxley Lecture delivered in the University of Birmingham, May 24, 1911.

WHEN a lecture is dedicated to the memory of a distinguished man of science, one cannot but feel some constraint in the choice of subject. It must be a subject that would have specially interested the person honoured. I feel no embarrassment on this account in regard to the great name of Huxley; the difficulty would be to find any problem to which his mind would have been indifferent, one of the greatest minds the England of the Nineteenth Century produced. And yet it seems to me that if one subject more than another would have appealed with particular force to the mind of a naturalist who was also a philosopher, it is the threefold problem of consciousness, of life and of their relation. For my part, I know no problem more fundamental in its importance, and it is this which I have chosen.

In dealing with this problem we cannot reckon much on the support of systems of philosophy. The problems men have most deeply at heart, those which

distress the human mind with anxious and passionate insistence, are not always the problems which hold the place of importance in the speculations of the metaphysicians. Whence are we? What are we? Whither tend we? These are the vital questions, which immediately present themselves when we give ourselves up to philosophical reflexion without regard to philosophical systems. But, between us and these problems, systematic philosophy interposes other problems. "Before seeking the solution of a problem," it says, "must we not first know how to seek it? Study the mechanism of thinking, then discuss the nature of knowledge and criticize the faculty of criticizing: when you have assured yourself of the value of the instrument, you will know how to use it." That moment, alas! will never come. I see only one means of knowing how far I can go: that is by going. If the knowledge we are in search of be real instruction, a knowledge which expands thought, then to analyse the mechanism of thought before seeking knowledge could only show the impossibility of ever getting it, since we should be studying thought before the expansion of it which it is the business of knowledge to obtain. A premature reflexion of the mind on itself would discourage it from advancing, whilst by simply advancing it would have come nearer to its goal and perceived, moreover, that the so-called obstacles were for the most part the effects of a

mirage. But suppose even that the metaphysician does not thus sacrifice the use of mind for the criticism of mind, the end for the means, the prey for the shadow: too often, when confronted with the problem of the origin, nature and destiny of man, he passes it by in order to deal with questions which he judges to be higher, and on which he thinks its solution depends. He speculates on existence in general, on the real and the possible, on time and space, on mind and matter, and from these generalities descends gradually to the consciousness and life whose essence he would understand. Now, is it not clear that his speculations have become purely abstract, with no bearing on the things themselves, but only on the altogether too simple idea of them which he has formed before he has studied them empirically? It would be impossible to explain a philosopher's attachment to so strange a method had it not the threefold advantage that it flatters his self-esteem, facilitates his work and gives him the illusion of definitive knowledge. As it leads him to some very general theory, to an almost empty concept, he can always, later on, place retrospectively in the concept whatever experience has come to teach him of the thing. He will then claim to have anticipated experience by the force of reasoning alone, to have embraced beforehand in a wider conception those conceptions, narrower, I confess, but the only ones difficult to form and the only ones useful to keep, which we get by the

study of facts. On the other hand, as nothing is easier than to reason geometrically with abstract ideas, he has no trouble in constructing an iron-bound system, which appears to be strong because it is unbending. But this apparent strength is simply due to the fact that the idea with which he works is diagrammatic and rigid and does not follow the sinuous and mobile contours of reality. How much better a more modest philosophy would be, one which would go straight to its object without worrying about the principles on which it depends! It would not aim at immediate certainty, which can only be ephemeral. It would take its time. It would be a gradual ascent to the light. Borne along in an experience growing ever wider and wider, rising to ever higher and higher probabilities, it would strive towards final certainty as to a limit.

I hold, for my part, that there is no principle from which the solution of the great problems can be mathematically deduced. Moreover, I am unable to discover any decisive fact which clinches the matter, such as we expect to find in physics and chemistry. But it seems to me that in different regions of experience there are different groups of facts, each of which, without giving us the desired knowledge, points out to us the direction in which we may find it. Now, to have only a direction is something. And it is still more to have several, for these directions will naturally converge towards one and the same point, and it is

that point we are seeking. In short, we possess even now a certain number of *lines of facts*, which do not go as far as we want, but which we can prolong hypothetically. I wish to follow out some of these with you. Each, taken apart, will lead us only to a conclusion which is simply probable; but taking them all together, they will, by their convergence, bring before us such an accumulation of probabilities that we shall feel on the road to certitude. Moreover, we shall come nearer and nearer to it through the joint effort of philosophers who will become partners. For, in this view, philosophy is no longer a construction, the systematic work of a single thinker. It needs, and unceasingly calls for, corrections and re-touches. It progresses like positive science. Like it, too, it is a work of collaboration.

The first line or direction which I invite you to follow is this. When we speak of mind we mean, above everything else, consciousness. What is consciousness? There is no need to define so familiar a thing, something which is continually present in every one's experience. I will not give a definition, for that would be less clear than the thing itself; I will characterize consciousness by its most obvious feature: it means, before everything else, memory. Memory may lack amplitude; it may embrace but a feeble part of the past; it may retain only what is just happen-

ing; but memory is there, or there is no consciousness. A consciousness unable to conserve its past, forgetting itself unceasingly, would be a consciousness perishing and having to be reborn at each moment: and what is this but unconsciousness? When Leibniz said of matter that it is "a momentary mind," did he not declare it, whether he would or no, insensible? All consciousness, then, is memory,— conservation and accumulation of the past in the present.

But all consciousness is also anticipation of the future. Consider the direction of your mind at any moment you like to choose; you will find that it is occupied with what now is, but always and especially with regard to what is about to be. Attention is expectation, and there is no consciousness without a certain attention to life. The future is there; it calls up, or rather, it draws us to it; its uninterrupted traction makes us advance along the route of time and requires us also to be continually acting. All action is an encroachment on the future.

To retain what no longer is, to anticipate what as yet is not,— these are the primary functions of consciousness. For consciousness there is no present, if the present be a mathematical instant. An instant is the purely theoretical limit which separates the past from the future. It may, in the strict sense, be conceived, it is never perceived. When we think we have seized hold of it, it is already far away. What we

actually perceive is a certain span of duration composed of two parts — our immediate past and our imminent future. We lean on the past, we bend forward on the future: leaning and bending forward is the characteristic attitude of a conscious being. Consciousness is then, as it were, the hyphen which joins what has been to what will be, the bridge which spans the past and the future. But what purpose does the bridge serve? What is consciousness called on to do?

In order to reply to the question, let us inquire what beings are conscious and how far in nature the domain of consciousness extends. But let us not insist that the evidence shall be complete, precise and mathematical; if we do, we shall get nothing. To know with scientific certainty that a particular being is conscious, we should have to enter into it, coincide with it, be it. It is literally impossible for you to prove, either by experience or by reasoning, that I, who am speaking to you at this moment, am a conscious being. I may be an ingeniously constructed natural automaton, going, coming, discoursing; the very words I am speaking to affirm that I am conscious may be being pronounced unconsciously. Yet you will agree that though it is not impossible that I am an unconscious automaton, it is very improbable. Between us there is an evident external resemblance; and from that external resemblance you conclude by analogy there is an internal likeness. Reasoning by analogy

never gives more than a probability; yet there are numerous cases in which that probability is so high that it amounts to practical certainty. Let us then follow the thread of the analogy and inquire how far consciousness extends, and where it stops.

It is sometimes said that, in ourselves, consciousness is directly connected with a brain, and that we must therefore attribute consciousness to living beings which have a brain and deny it to those which have none. But it is easy to see the fallacy of such an argument. It would be just as though we should say that because in ourselves digestion is directly connected with a stomach, therefore only living beings with a stomach can digest. We should be entirely wrong, for it is not necessary to have a stomach, nor even to have special organs, in order to digest. An amoeba digests, although it is an almost undifferentiated protoplasmic mass. What is true is that in proportion to the complexity and perfection of an organism there is a division of labour; special organs are assigned special functions; and the faculty of digesting is localized in the stomach, or rather in a general digestive apparatus, which works better because confined to that one function alone. In like manner, consciousness in man is unquestionably connected with the brain: but it by no means follows that a brain is indispensable to consciousness. The lower we go in the animal series, the more the nervous centres

are simplified and separate from one another, and at last they disappear altogether, merged in the general mass of an organism with hardly any differentiation. If then, at the top of the scale of living beings, consciousness is attached to very complicated nervous centres, must we not suppose that it accompanies the nervous system down its whole descent, and that when at last the nerve stuff is merged in the yet undifferentiated living matter, consciousness is still there, diffused, confused, but not reduced to nothing? Theoretically, then, everything living might be conscious. *In principle,* consciousness is co-extensive with life. Now, is it so *in fact?* Does not consciousness, occasionally, fall asleep or slumber? This is probable, and here is a second line of facts which leads to this conclusion.

In the living being which we know best, it is by means of the brain that consciousness works. Let us then cast a glance at the human brain and see how it functions. The brain is part of a nervous system which includes, together with the brain proper, the spinal cord, the nerves, etc. In the spinal cord there are mechanisms set up, each of which contains, ready to start, a definite complicated action which the body can carry out at will, just as the rolls of perforated paper which are used in the pianola mark out beforehand the tunes which the instrument will play. Each of these mechanisms can be set working directly by

an external cause: the body, then, at once responds to the stimulus received by executing a number of interco-ordinated movements. But in some cases the stimulus, instead of obtaining immediately a more or less complicated reaction from the body by addressing itself directly to the spinal cord, mounts first to the brain, then redescends and calls the mechanism of the spinal cord into play after having made the brain intervene. Why is this indirect path taken? What purpose is served by the intervention of the brain? We may easily guess, if we consider the general structure of the nervous system. The brain is in a general relation to all the mechanisms in the spinal cord and not only to some particular one among them; also it receives every kind of stimulus, not only certain special kinds. It is therefore a crossway, where the nervous impulse arriving by any sensory path can be directed into any motor path. Or, if you prefer, it is a commutator, which allows the current received from one point of the organism to be switched in the direction of any motor contrivance. When the stimulus, then, instead of following the direct path, goes off to the brain, it is evidently in order that it may set in action a motor mechanism which has been chosen, instead of one which is automatic. The spinal cord contains a great number of ready-formed responses to the question which the circumstances address to it; the intervention of the brain secures that the most appropriate

among them shall be given. The brain is an organ of choice.

Now, the further we descend the scale of the animal series, the less and less definite we find the separation becoming between the functions of the spinal cord and those of the brain. The faculty of choosing, at first localized in the brain, extends gradually to the spinal cord, which then, probably, constructs somewhat fewer mechanisms and also mounts them with less precision. At last, when we come to the nervous system which is rudimentary, still more when distinct nervous elements have disappeared altogether, automatism and choice are fused into one. The reaction is now so simple that it appears almost mechanical; it still hesitates and gropes, however, as though it would be voluntary. The amoeba, for instance, when in presence of a substance which can be made food, pushes out towards it filaments able to seize and enfold foreign bodies. These pseudopodia are real organs and therefore mechanisms; but they are only temporary organs created for the particular purpose, and it seems they still show the rudiments of choice. From top to bottom, therefore, of the scale of animal life we see being exercised, though the form is ever vaguer as we descend, the faculty of choice, that is, the responding to a definite stimulus by movements more or less unforeseen. This then is what we find along the second line of facts. It re-enforces the conclusion we had come

to before; for if, as we said, consciousness retains the past and anticipates the future, it is probably because it is called on to make a choice. In order to choose, we must know what we can do and remember the consequences, advantageous or injurious, of what we have already done; we must foresee and we must remember. And now we are going to see that our first conclusion, re-enforced by this new line of facts, supplies an intelligible answer to the question before us: are all living beings conscious, or does consciousness cover a part only of the domain of life?

If consciousness mean choice and if its role be to decide, it is unlikely that we shall meet it in organisms which do not move spontaneously, and which have no decision to take. Strictly speaking, there is no living being which appears completely incapable of spontaneous movement. Even in the vegetable world, where the organism is generally fixed to the soil, the faculty of movement is dormant rather than absent; it awakens when it can be of use. I believe all living beings, plants and animals, possess it in right; but many of them have renounced it in fact,— some animals, especially those which have become parasitic on other organisms and have no need of moving about to find their nourishment, and the vast majority of plants: has it not been said that plants are earth-parasites? It appears to me therefore extremely likely that consciousness, originally immanent in all that lives,

is dormant where there is no longer spontaneous movement, and awakens when life tends to free activity. We can verify the law in ourselves. What happens when one of our actions ceases to be spontaneous and becomes automatic? Consciousness departs from it. In learning an exercise, for example, we begin by being conscious of each of the movements we execute. Why? Because we originate the action, because it is the result of a decision and implies a choice. Then, gradually, as the movements become more and more linked together and more and more determine one another mechanically, dispensing us from the need of choosing and deciding, the consciousness of them diminishes and disappears. On the other hand, when is it that our consciousness attains its greatest liveliness? Is it not at those moments of inward crisis when we hesitate between two, or it may be several, different courses to take, when we feel that our future will be what we make it? The variations in the intensity of our consciousness seem then to correspond to the more or less considerable sum of choice or, as I would say, to the amount of creation, which our conduct requires. Everything leads us to believe that it is thus with consciousness in general. If consciousness means memory and anticipation, it is because consciousness is synonymous with choice.

Let us then imagine living matter in its elementary form, such as it may have been when it first appeared:

a simple mass of protoplasmic jelly like the amoeba, which can undergo change of form at will, and is therefore vaguely conscious. Now, for it to grow and evolve, there are two ways open. It may take the path towards movement and action,— movement growing ever more effective, action growing freer and freer. The path towards movement involves risk and adventure, but also it involves consciousness, with its growing degrees of intensity and depth. It may take the other path, it may abandon the faculty of acting and choosing, the potentiality of which it carries within it, may accommodate itself to obtain from the spot where it is all it requires for its support, instead of going abroad to seek it. Existence is then assured to it, a tranquil, unenterprising existence, but this existence is also torpor, the first effect of immobility: the torpor soon becomes fixed; this is unconsciousness. These are the two paths which lie open before the evolution of life. Living matter finds itself committed partly to the one path, partly to the other. Speaking generally, the first path may be said to mark the direction of the animal world (we have to qualify it, because many animal species renounce movement and with it probably consciousness also); the second may be said to mark the direction of the vegetable world (again it has to be qualified, for mobility, and therefore probably consciousness also, may occasionally be awakened in plants).

When, now, we reflect on this bias or tendency of life at its entry into the world, we see it bringing something which encroaches on inert matter. The world left to itself obeys fatalistic laws. In determinate conditions matter behaves in a determinate way. Nothing it does is unforeseeable. Were our science complete and our calculating power infinite, we should be able to predict everything which will come to pass in the inorganic material universe, in its mass and in its elements, as we predict an eclipse of the sun or moon. Matter is inertia, geometry, necessity. But with life there appears free, predictable, movement. The living being chooses or tends to choose. Its role is to create. In a world where everything else is determined, a zone of indetermination surrounds it. To create the future requires preparatory action in the present, to prepare what will be is to utilize what has been: life therefore is employed from its start in conserving the past and anticipating the future in a duration in which past, present and future tread one on another, forming an indivisible continuity. Such memory, such anticipation, are consciousness itself. This is why, in right if not in fact, consciousness is co-extensive with life.

Consciousness and matter appear to us, then, as radically different forms of existence, even as antagonistic forms, which have to find a *modus vivendi*. Matter is necessity, consciousness is freedom; but though

diametrically opposed to one another, life has found the way of reconciling them. This is precisely what life is,— freedom inserting itself within necessity, turning it to its profit. Life would be an impossibility were the determinism of matter so absolute as to admit no relaxation. Suppose, however, that at particular moments and at particular points matter shows a certain elasticity, then and there will be the opportunity for consciousness to instal itself. It will have to humble itself at first; yet, once installed, it will dilate, it will spread from its point of entry and not rest till it has conquered the whole, for time is at its disposal, and the slightest quantity of indetermination, by continually adding to itself, will make up as much freedom as you like. But here are new lines of facts which point to the same conclusion with still greater precision.

When we investigate the way in which a living body goes to work to execute movements, we find that the method it employs is always the same. This consists in utilizing certain unstable substances which, like gunpowder, need only a spark to explode them. I refer to foodstuffs, especially the ternary substances, — the carbo-hydrates and fats. A considerable sum of potential energy, accumulated in them, is ready to be converted into movement. That energy has been slowly and gradually borrowed from the sun by plants; and the animal which feeds on a plant,

or on an animal which has been fed on a plant, or on an animal which has fed on an animal which has been fed on a plant, and so on, simply receives into its body an explosive which life has fabricated by storing solar energy. To execute a movement, the imprisoned energy is liberated. All that is required is, as it were, to press a button, touch a hair-trigger, apply a spark: the explosion occurs, and the movement in the chosen direction is accomplished. The first living beings appear to have hesitated between the vegetable and animal life: this means that life, at the outset, undertook to perform the twofold duty, both to fabricate the explosive and to utilize it in movements. As vegetables and animals became differentiated, life split off into two kingdoms, thus separating from one another the two functions primitively united. The one became more preoccupied with the fabrication of explosives, the other with their explosion. But life as a whole, whether we envisage it at the start or at the end of its evolution, is a double labour of slow accumulation and sudden discharge. Its task is to ensure that matter, by a slow and difficult process, shall store potential energy and hold it available at need as kinetic energy. Now, what could a free cause do,— a cause which although unable to break the necessity to which matter is subject would yet be able to bend it,— a cause which although able to exercise but a very small influence on matter yet should purpose to obtain move-

ments ever more powerful in a direction ever more freely chosen? Would it not behave exactly in this way? It would strive to have nothing more to do, in order to release an energy which it had caused matter slowly to accumulate, than touch a spring or apply a spark.

We shall come to the same conclusion along a third line of facts. Let us consider the idea which precedes an action in conscious beings, apart from the action itself. What is the sign by which we recognize the man of action, the man who leaves his mark on the events in which chance has called on him to take part? Is it not the momentary vision which embraces a whole course of events within one purview? The greater his hold on the past in his present vision, the heavier is the mass he is pushing against the eventualities preparing. His action, like an arrow, flies forward with the greater force the more tensely in memory his idea had been strung. Now think of our visual consciousness in relation to the perceptual matter it apprehends. In its briefest moment consciousness embraces thousands of millions of vibrations which for inert matter are successive; if matter were endowed with memory, the first of these would appear to the last in the infinitely remote past. When I open and close my eyes in rapid succession, I experience a succession of visual sensations each of which is the condensation of an extraordinarily long history unrolled in the external world.

There are then, succeeding one another, billions of vibrations, that is a series of events which, even with the greatest possible economy of time, would take me thousands of years to count. Yet these dull and monotonous events, which would fill thirty centuries of a matter become self-conscious, occupy only a second of my own consciousness, able to contract them into one picturesque sensation of light. Moreover, just the same could be said of all the other sensations. Placed at the confluence of consciousness and matter, sensation condenses, into the duration which belongs to us and characterizes our consciousnes, immense periods of what we can call by analogy the duration of things. Must we not think, then, that if our perception contracts material events in this way it is in order that our action may dominate them? Supposing the necessity inherent in matter be such that at each of its moments it can be forced, but only within extremely restricted limits, how in such case must a consciousness proceed if it would insert a free action into this material world, let that action be no more than releasing a spring or directing a movement? Would it not have to adopt precisely this method? Should we not expect to find between its duration and the duration of things a difference of tension such that innumerable instants of the material world could be held within one single instant of the conscious life, so that the desired action, accomplished by consciousness in one of its

moments, could be distributed over an enormous number of the moments of matter and so sum up within it the indeterminations almost infinitesimal which each of them admits? In other words, is not the tension of the duration of a conscious being the measure of its power of acting, of the quantity of free creative activity it can introduce into the world? I hold that it is, but for the moment I will not press this. All I wish to say is that this new line of facts leads us to the same conclusion as the former line. Whether we consider the act which consciousness decrees or the perception which prepares that act, in either case consciousness appears as a force seeking to insert itself in matter in order to get possession of it and turn it to its profit. It works in two complementary ways:—in one, by an explosive action, it liberates instantly, in the chosen direction, energy which matter has been accumulating during a long time; in the other, by a work of contraction, it gathers into a single instant the incalculable number of small events which matter holds distinct, as when we sum up in a word the immensity of a history.

Let us then place ourselves at the converging point of these different lines of facts. On the one hand, there is matter, subject to necessity, devoid of memory, or at least with no more than suffices to form the bridge between two of its moments, each of which can be

deduced from its antecedent, each of which adds nothing to what the world already contains. On the other hand, there is consciousness, memory with freedom, continuity of creation in a duration in which there is real growth;— a duration which is drawn out, wherein the past is preserved indivisible; a duration which grows like a plant, but like the plant of a fairy tale transforms its leaves and flowers from moment to moment. We may surmise that these two realities, matter and consciousness, are derived from a common source. If, as I have tried to show in a previous work (*Creative Evolution*), matter is the inverse of consciousness, if consciousness is action unceasingly creating and enriching itself, whilst matter is action continually unmaking itself or using itself up, then neither matter nor consciousness can be explained apart from one another. I will not return to this theme now, I will merely say that I see in the whole evolution of life on our planet a crossing of matter by a creative consciousness, and effort to set free, by force of ingenuity and invention, something which in the animal still remains imprisoned and is only finally released when we reach man.

We need not go into the details of the scientific investigations which since Lamarck and Darwin have come more and more to confirm the idea of an evolution of species, that is, of the generation of species from one another, the organized forms from the

simpler. We can hardly refuse to accept a hypothesis which has the threefold support of comparative anatomy, of embryology and of paleontology. Science has shown, moreover, along the whole evolution of life, the various consequences attending upon the fact that living beings must be adapted to the conditions of the environment. Yet this necessity would seem to explain the arrest of life in various definite forms, rather than the movement which carries the organization ever higher. A very inferior organism is as well adapted as ours to the conditions of existence, judged by its success in maintaining its life: why, then, does life which has succeeded in adapting itself go on complicating itself, and complicating itself more and more dangerously? Some living forms to be met with today have come down unchanged from remotest palaeozoic times; they have persisted, unchanged, throughout the ages. Life then might have stopped at some one definite form. Why did it not stop wherever it was possible? Why has it gone on? Why,—unless it be that there is an impulse driving it to take ever greater and greater risks towards its goal of an ever higher and higher efficiency?

Even a cursory survey of the evolution of life gives us the feeling that this impulse is a reality. Yet we must not think that it has driven living matter in one single direction, nor that the different species represent so many stages along a single route, nor that

the course has been accomplished without obstacle. It is clear that the effort has met with resistance in the matter which it has had to make use of; it has needed to split itself up, to distribute along different lines of evolution the tendencies it bore within it; it has turned aside, it has retrograded; at times it has stopped short. On two lines only has it achieved an undeniable success, partial in the one case, relatively complete in the other. These are the lines of evolution of the arthropods and the vertebrates. At the end of the first line, we find the instincts of the insect; at the end of the second, human intelligence. We have good ground, then, for believing that the evolving force bore within it originally, but confused together or rather the one implied in the other, instinct and intelligence.

Things have happened just as though an immense current of consciousness, interpenetrated with potentialities of every kind, had traversed matter to draw it towards organization and make it, notwithstanding that it is necessity itself, an instrument of freedom. But consciousness has had a narrow escape from being itself ensnared. Matter, enfolding it, bends it to its own automatism, lulls it to sleep in its own unconsciousness. On certain lines of evolution, those of the vegetable world in particular, automatism and unconsciousness are the rule: the freedom immanent in evolution is shown even here, no doubt, in the creation of un-

foreseen forms which are veritably works of art; but, once created, the individual has no choice. On other lines, consciousness succeeds in freeing itself sufficiently for the individual to acquire feeling, and therewith a certain latitude of choice; but the necessities of existence restrict the power of choosing to a simple aid of the need to live. So, from the lowest to the highest rung of the ladder of life, freedom is riveted in a chain which at most it succeeds in stretching. With man alone a sudden bound is made; the chain is broken. The human brain closely resembles the animal brain, but it has, over and above, a special factor which furnishes the means of opposing to every contracted habit another habit, and to every automatism an antagonistic automatism. Freedom, coming to itself whilst necessity is at grips with itself, brings back matter to the condition of being a mere instrument. It is as though it had divided in order to rule.

That the united efforts of physics and chemistry to manufacture matter resembling living matter may one day be successful is by no means improbable, for life proceeds by insinuating, and the force which drew matter away from pure mechanism could not have taken hold of matter had it not first itself adopted that mechanism. In such wise, the points of the railway coincide at first with the lines from which they will shunt the train. In other words, life must have installed itself in a matter which had already acquired

some of the characters of life without the work of life. But matter left to itself would have stopped there; and the work of our laboratories will probably go no further. We shall reproduce, that is to say, some characters of living matter; we shall not obtain the push in virtue of which it reproduces itself and, in the meaning of transformism, evolves. Now, reproduction and evolution are life itself. Both are the manifestation of an inward impulse, of the twofold need of increasing in number and wealth by multiplication in space and complication in time, of two instincts which make their appearance with life and later become the two great motives in human activity, love and ambition. Visibly there is a force working, seeking to free itself from trammels and also to surpass itself, to give first all it has and then something more than it has. What else is mind? How can we distinguish the force of mind, if it exist, from other forces save in this, that it has the faculty of drawing from itself more than it contains? Yet we must take into account the obstacles of every kind that such a force will meet on its way. The evolution of life, from its early origins up to man, presents to us the image of a current of consciousness flowing against matter, determined to force for itself a subterranean passage, making tentative attempts to the right and to the left, pushing more or less ahead, for the most part encountering rock and breaking itself against it, and yet,

in one direction at least, succeeding in piercing its way through and emerging into the light. That direction is the line of evolution which ends in man.

Now why did mind engage in such an enterprise? What interest could it have had in boring the tunnel? To answer this inquiry, we should have again to follow several new lines of facts and see them converge on one single point. But this would require us to go into details concerning psychical life, concerning the psycho-physiological relation, concerning the moral ideal and social progress. Let us rather go at once to the conclusion. Here are matter and consciousness confronting one another. Matter is primarily what brings division and precision. A thought, taken by itself, is a reciprocal implication of elements of which we cannot say that they are one or many. Thought is a continuity, and in all continuity there is confusion. For a thought to become distinct, there must be dispersion in words. Our only way of taking count of what we have in mind is to set down on a sheet of paper, side by side, terms which in our thinking interpenetrate. Just in this way does matter distinguish, separate, resolve into individualities, and finally into personalities, tendencies before confused in the original impulse of life. On the other hand, matter calls forth effort and makes it possible. Thought which is only thought, the work of art which is only conceived, the poem which is no more than a

dream, as yet cost nothing in toil; it is the material realization of the poem in words, of the artistic conception in statue or picture, which demands effort. The effort is toilsome, but also it is precious, more precious even than the work which it produces, because, thanks to it, one has drawn out from the self more than it had already, we are raised above ourselves. This effort was impossible without matter. By the resistance matter offers and by the docility with which we endow it, is at one and the same time obstacle, instrument and stimulus. It experiences our force, keeps the imprint of it, calls for its intensification.

Philosophers who have speculated on the meaning of life and on the destiny of man have failed to take sufficient notice of an indication which nature itself has given us. Nature warns us by a clear sign that our destination is attained. That sign is joy. I mean joy, not pleasure. Pleasure is only a contrivance devised by nature to obtain for the creature the preservation of its life, it does not indicate the direction in which life is thrusting. But joy always announces that life has succeeded, gained ground, conquered. All great joy has a triumphant note. Now, if we take this indication into account and follow this new line of facts, we find that wherever there is joy, there is creation; the richer the creation, the deeper the joy. The mother beholding her child is joyous, because she

is conscious of having created it, physically and morally. The merchant developing his business, the manufacturer seeing his industry prosper, are joyous, — is it because money is gained and notoriety acquired? No doubt, riches and social position count for much, but it is pleasures rather than joy that they bring; true joy, here, is the feeling of having started an enterprise which goes, of having brought something to life. Take exceptional joys,— the joy of the artist who has realized his thought, the joy of the thinker who has made a discovery or invention. You may hear it said that these men work for glory and get their highest joy from the admiration they win. Profound error! We cling to praise and honours in the exact degree in which we are not sure of having succeeded. There is a touch of modesty in vanity. It is to reassure ourselves that we seek approbation; and just as we wrap the prematurely born child in cotton wool, so we gather round our work the warm admiration of mankind in case there should be insufficient vitality. But he who is sure, absolutely sure, of having produced a work which will endure and live, cares no more for praise and feels above glory, because he is a creator, because he knows it, because the joy he feels is the joy of a god. If, then, in every domain the triumph of life is creation, must we not suppose that human life has its goal in a creation which, unlike that of the artist and philosopher, can be pursued always by all men — creation

of self by self, the growing of the personality by an effort which draws much from little, something from nothing, and adds unceasingly to whatever wealth the world contains?

Regarded from without, nature appears an immense inflorescence of unforeseeable novelty. The force which animates it seems to create lovingly, for nothing, for the mere pleasure of it, the endless variety of vegetable and animal species. On each it confers the absolute value of a great work of art. It seems as much attached to the first comer as to man himself. But the form of a living being, once designed, is thenceforward indefinitely repeated, and the acts of this living being, once performed, tend to imitate themselves and recommence automatically. Automatism and repetition, which prevail everywhere except in man, should warn us that living forms are only halts: this work of marking time is not the forward movement of life. The artist's standpoint is therefore important, but not final. Richness and originality of forms do indeed indicate an expansion of life, but in this expansion, where beauty means power, life also shows a stop of its impulse, a momentary powerlessness to push farther, like the boy who rounds off in a graceful curve the end of the slide.

The standpoint of the moralist is higher. In man alone, especially among the best of mankind, the vital movement pursues its way without hindrance, thrust-

ing through that work of art, the human body, which it has created on its way, the creative current of the moral life. Man, called on at every moment to lean on the totality of his past in order to bring his weight to bear more effectively on the future, is the great success of life. But it is the moral man who is a creator in the highest degree,— the man whose action, itself intense, is also capable of intensifying the action of other men, and, itself generous, can kindle fires on the hearths of generosity. The men of moral grandeur, particularly those whose inventive and simple heroism has opened new paths to virtue, are revealers of metaphysical truth. Although they are the culminating point of evolution, yet they are nearest the source and they enable us to perceive the impulsion which comes from the deep. It is in studying these great lives, in striving to experience sympathetically what they experience, that we may penetrate by an act of intuition to the life principle itself. To pierce the mystery of the deep, it is sometimes necessary to regard the heights. It is earth's hidden fire which appears at the summit of the volcano.

On the two great routes that the vital impulse has found open before it, along the series of the arthropods and the series of the vertebrates, instinct and intelligence, at first wrapped up confusedly within one another, have in their development taken divergent directions. At the culminating point of the first evolu-

tion are the hymenoptera, at the culminating point of the second, man. In each, in spite of the radical difference in the forms attained and the growing separation of the paths followed, it is to social life that evolution leads, as though the need of it was felt from the beginning, or rather as though there were some original and essential aspiration of life which could find full satisfaction only in society. Society, which is the community of individual energies, benefits from the efforts of all its members and renders effort easier to all. It can only subsist by subordinating the individual, it can only progress by leaving the individual free: contradictory requirements, which have to be reconciled. With insects, the first condition alone is fulfilled. The societies of ants and bees are admirably disciplined and united, but fixed in an invariable routine. If the individual is forgotten in the society, the society on its part also has forgotten its destination. Individual and society, both in a state of somnambulism, go round and round in the same circle, instead of moving straight forward to a greater social efficiency and a completer individual freedom. Human societies, alone, have kept full in view both the ends to be attained. Struggling among themselves and at war with one another, they are seeking clearly, by friction and shock, to round off the angles, to wear out antagonisms, to eliminate contradictions, to bring about that individual wills should insert them-

selves in the social will without losing their individual form, and that different and diverse societies should enter in their turn into a wider and more inclusive society and yet not lose their originality or their independence. The spectacle is both disquieting and reassuring, for we cannot contemplate it without saying that, here too, across innumerable obstacles, life is working both by individualization and integration to obtain the greatest quantity, the richest variety, the highest qualities, of invention and effort.

To conclude, then, the aspirations of our moral nature are not in the least contradicted by positive science. On this, as on many other points, I quite agree with the opinion expressed by Sir Oliver Lodge in many of his works, and especially in his admirable book on *Life and Matter*. How could there be disharmony between our intuitions and our science, how especially could our science make us renounce our intuitions, if these intuitions are something like instinct, — an instinct conscious, refined, spiritualized,— and if instinct is still nearer life than intellect and science? Intuition and intellect do not oppose each other, save where intuition refuses to become more precise by coming into touch with facts scientifically studied, and where intellect, instead of confining itself to science proper (that is, to what can be inferred from facts or proved by reasoning), combines with this an uncon-

scious and inconsistent metaphysic which in vain lays claim to scientific pretensions.

If we now take into account that the mental activity of man overflows his cerebral activity, that his brain is a storehouse of motor habits but not of memories, that the other functions of thought are even more independent of the brain than memory is, that preservation and even intensification of personality are not only possible but even probable after the disintegration of the body, shall we not suspect that, in its passage through the matter which it finds here, consciousness is tempering itself like steel and preparing itself for a more efficient action, for an intenser life? That life, as I imagine it, is still a life of striving, a need of invention, a creative evolution: to it each of us might come by the play of natural forces alone, taking our place on the moral plane to which in this life the quality and quantity of our effort had already virtually raised us, as the balloon set free takes the position in the air which its density assigns it. I admit that this is no more than a hypothesis. We were just now in the region of the probable, this is the region of the simply possible. Let us confess our ignorance, but let us not resign ourselves to the belief that we can never know. If there be a beyond for conscious beings, I cannot see why we should not be able to discover the means to explore it. Nothing which con-

cerns man is likely to conceal itself deliberately from the eyes of man. Sometimes, moreover, the information we imagine to be far off, even infinitely distant, is at our side, waiting only till it pleases us to notice it. Recollect what has happened in regard to another beyond, that of ultra-planetary space. Auguste Comte declared the chemical composition of the heavenly bodies to be for ever unknowable by us. A few years later the spectroscope was invented, and today we know, better than if we had gone there, what the stars are made of.

II

THE SOUL AND THE BODY

A Lecture delivered in Paris, at Foi et Vie, *April* 28, 1912.

THE subject of my lecture is "The Soul and the Body." When I say that by this I mean Matter and Mind, you may fear that I am about to embark on a general disquisition concerning all that exists and even, it may be, a great deal that does not exist. But be reassured — it is not my intention to try to discover the fundamental nature of matter, much less the fundamental nature of mind. It is possible to distinguish two things from one another, and to a certain point to determine their relations, without needing to know the nature of each of them. It is impossible for me at this moment to be acquainted with all of the people now around me, yet I distinguish myself from them and also see the place they occupy in relation to me. So in the case of the body and the soul; to define the essence of each would be a long and arduous undertaking; but it is easier to know what unites and what separates them, for their union and separation are facts of experience.

First, then, what does the simple and direct experi-

ence of common sense tell us on this point? Each of us is a body, subject to the same laws as all other portions of matter. When pushed, we advance; when pulled, we recoil; when lifted up and let go, we fall. But, besides these movements which are mechanically provoked by an external cause, there are others which seem to come from within and which cut across the first kind by their unforeseen character: they are called "voluntary." What is the cause of them? It is what each of us denotes by the words "I" or "me." And what is the "I"? Something which appears, rightly or wrongly, to overflow every part of the body which is joined to it, passing beyond it in space as well as in time. In space, for the body of each of us is confined within the distinct surfaces which bound it, whilst by our faculty of perception, and more especially of seeing, we radiate far beyond our bodies, even to the stars. In time, for the body is matter, matter is in the present, and, if it be true that the past leaves there traces of itself, they are not traces of the past except for a consciousness perceiving them and interpreting what it perceives by the light of what it remembers. This consciousness retains the past, enrolls what time unrolls, and with it prepares a future which it will itself help to create. Indeed, the voluntary act, of which I have just spoken, is nothing but a group of movements learnt in previous experience, and inflected in a direction each time new by

a conscious force whose main purpose appears to be the ceaseless bringing of something new into the world. Yes, it creates something new outside itself, since it outlines in space unforeseen, unforeseeable movements. And also it creates something new inside itself, since the voluntary action reacts on him who wills it, modifies in some degree the character of the person from whom it emanates, and accomplishes, by a kind of miracle, that creation of self by itself which seems to be the very object of human life. To sum up, then, besides the body which is confined to the present moment in time and limited to the place it occupies in space, which behaves automatically and reacts mechanically to external influences, we apprehend something which is much more extended than the body in space and which endures through time, something which requires from, or imposes on, the body movements no longer automatic and foreseen, but unforeseeable and free. This thing, which overflows the body on all sides and which creates acts by new-creating itself, is the "I," the "soul," the "mind"— mind being precisely a force which can draw from itself more than it contains, yield more than it receives, give more than it has. This is what I believe I see. Such is the appearance.

Some one may say to me: "Very good, but it is only an appearance." Look closer. Listen to what science says. "In the first place, you will yourself

acknowledge that this 'soul' is never seen at work without a body. Its body accompanies it from birth to death, and even supposing the soul be really distinct from the body, everything happens as though it were inseparably united to it. Your consciousness vanishes if you inhale chloroform, it is heightened if you drink alcohol or coffee. A slight intoxication may set up troubles profoundly affecting intelligence, sensibility and will. A lasting intoxication, such as certain infectious diseases leave behind, will produce insanity. If it be true that the autopsy does not invariably disclose lesions in the brain of the insane, at least it often does, and even when there is no visible lesion, it is probable that a chemical change in the tissues has caused the disease. Let us go further: science can localize in definite convolutions of the brain definite functions of the mind, such as the faculty of performing voluntary movements, of which you spoke just now. Lesions of particular points in the Rolandic area, between the frontal and the parietal lobes, involve the loss of movements of the arm, of the leg, of the face, of the tongue, according to the exact spot affected. Even memory, which you consider an essential function of the mind, has been partly localized. At the foot of the third left frontal convolution are seated the memories of the movements of the articulation of speech; in one region between the first and second left temporal convolutions is preserved the memory of the sound of

words; at the posterior part of the second left parietal convolution are deposited the visual images of words, and of letters, etc. Let us go further still. You said that in space, as in time, the soul overflows the body to which it is joined. Let us consider space. It is true that sight and hearing go beyond the limits of the body. But why? Because vibrations from afar have impressed eye and ear and been transmitted to the brain; there, in the brain, the stimulation has become auditory or visual sensation; perception is therefore within the body and not spread abroad. Let us consider time. You claim that the mind embraces the past, whilst the body is confined within a present which recommences without ceasing. But we recall the past only because our body preserves the still present traces of it. The impressions made by objects on the brain abide there like the images on a sensitive plate, or the records on gramophone disks. Just as the disk repeats the melody when the apparatus is set working, so the brain revives the memory when the requisite shock is produced at the point where the impression is retained. So then, no more in time than in space does the soul overflow the body. But is there really a soul distinct from the body? We have just seen that changes, or, to be more exact, displacements and new groupings of molecules and atoms are continually going on in the brain. Some of these express themselves in what we call sensations, others in memories; without

any doubt brain-changes correspond to all intellectual, sensible and voluntary facts. To them consciousness is superadded, a kind of phosphorescence; it is like the luminous trail of the match we strike on the wall in the dark. This phosphorescence, being, as it were, a self-illumination, begets strange internal optical illusions; so consciousness imagines itself to be modifying, directing and producing the movements when in fact it is itself the result of them. The belief in free will consists in this. The truth is that could we look through the skull and observe the inner working of the brain with instruments magnifying some billion times more than our most powerful microscopes, if we then should witness the dance of the molecules, atoms and electrons of which the cerebral cortex is composed, and if in addition we possessed the rule for transposing the cerebral into the mental,— a dictionary, so to speak, which would enable us to translate each figure of the dance into the language of thought and feeling,— we should know, quite as well as the supposed ' soul,' what it was thinking, feeling and wishing, what it would be believing itself doing freely, though it would only be acting mechanically. We should know it, indeed, much better than it could know itself, for this so-called conscious ' soul ' lights up only a small part of the intra-cerebral dance;— the soul is only the assemblage of will-o-the-wisps which hover above certain privileged groups of atoms;— whereas we should be observing all

the groups of all the atoms, the whole intra-cerebral dance. Your 'conscious soul' is at most an effect which perceives effects: we should be seeing the effects and the causes."

This is what is sometimes said in the name of science. But is it not clear that if by "scientific" we mean what is observed or observable, demonstrated or demonstrable, then a theory such as we have just sketched is not scientific, for in the present state of science we cannot even have a notion of the possibility of verifying it? It is alleged, it is true, that the law of the conservation of energy is opposed to the idea that even the smallest quantity of force or movement is created in the universe, and that if things did not behave mechanically in the manner just stated, and if an efficient will could intervene to perform free actions, the law of the conservation of energy would be violated. But to reason thus is simply to beg the question, for the law of the conservation of energy, like all physical laws, is no more than a deduction from observations of physical phenomena; it expresses what happens in a domain wherein no one has ever held that there was caprice, choice or liberty; and what precisely we want to know is whether it can still be verified in the cases in which consciousness (which, after all, is a faculty of observation and which experiments in its own way) feels itself in possession of a free activity. Whatever is directly

presented to the senses or to consciousness, whatever is an object of experience, whether external or internal, must be held to be real so long as it has not been proved to be a simple appearance. Now, that we feel ourselves free, that such is our immediate impression, is not in doubt. On those who hold that the feeling is illusory, then, falls the onus of proof,—and they can prove nothing of the kind, since all they can do is to extend arbitrarily to voluntary actions a law verified in cases in which the will does not intervene. I quite agree that, if the will is capable of creating energy, the quantity created may be so small that it would not affect sensibly our instruments of measurement. Yet its effect might be enormous, like that of the spark which explodes a powder-magazine. I will not enter into a thorough investigation of this point. It is enough for me to say that when we consider the mechanism of voluntary movement in particular, the functioning of the nervous system in general, and in fact life itself in what is essential to it, we are led to the conclusion that the invariable contrivance of consciousness, from its most humble origin in elementary living forms, is to convert physical determinism to its own ends, or rather to elude the law of conservation of energy whilst obtaining from matter a fabrication of explosives, ever intenser and more utilizable. It will then require an almost negligible action, such as the slight pressure of the finger on the

hair-trigger of a pistol, in order to liberate at the required moment, in the direction chosen, as great an amount as is wanted of accumulated energy. The glycogen lodged in the muscles is, in fact, a real explosive; by it voluntary movement is accomplished: to make and utilize explosives of this kind seems to be the unvarying and essential preoccupation of life, from its first apparition in protoplasmic masses, deformable at will, to its complete expansion in organisms capable of free actions. But I will not dwell further on what after all is only a parenthesis; I have dealt with the subject elsewhere. So I come back to what I said at first, that it is impossible to call a thesis scientific which is neither proved nor even suggested by experience.

What in fact does experience tell us? It tells us that the life of the soul, or, to use a term which does not appear to beg the question, the life of the mind, is bound to the life of the body, that there is solidarity between them, nothing more. But this point has never been contested by any one; it is a long way from that to maintain that the cerebral is the equivalent of the mental, that one might read in a brain whatever is taking place in the corresponding mind. A coat is solidary with the nail on which it hangs; it falls if the nail is removed; it sways if the nail is loose and shaken; it is torn or pierced if the nail is too pointed; it does not follow from all this that each detail of the nail

corresponds to a detail of the coat, nor that the nail is the equivalent of the coat, still less that nail and coat are the same thing. So, too, the mind is undeniably attached to the brain, but from this it does not in the least follow that in the brain is pictured every detail of the mind, nor that the mind is a function of the brain. All that observation, experience, and consequently science, allows us to affirm is the existence of a certain *relation* between brain and mind.

What is this relation? Ah! We may indeed challenge philosophy here! Has it ever really given us what we had the right to expect? To philosophy falls the task of studying the life of the soul in all its manifestations. Practised in introspection, the philosopher ought to descend within himself, and then, remounting to the surface, follow the gradual movement by which consciousness detends, extends and prepares to evolve in space. Watching this progressive materialization, marking the steps by which consciousness externalizes itself, at least he would obtain a vague intuition of what the insertion of mind in matter, the relation of body to soul, may be. No doubt it would be only a first glimmer, nothing more. But, had we only this glimmer, it would enable us to pick our way amongst the innumerable facts with which psychology and pathology deal. These facts, in their turn, correcting and completing what is incomplete or defective in the internal experience, would rectify the method

of internal observation. Thus, by an indefinite series of comings and goings between two centres of observation, one situated within, the other without, we should obtain a solution more and more adequate to the problem, never perfect, as the solutions of metaphysicians too often claim to be, but always perfectible, like those of science. The first impulse would, it is true, have come from within; it is in the internal vision that we should have sought the chief enlightenment; and that is why the problem would remain what it must be, a problem of philosophy.

But metaphysicians do not readily descend from the heights whereon they love to dwell. Plato invited philosophers to turn towards the world of Ideals. Willingly they visit in that society, mixing only with well-dressed concepts, offering them opportunities to meet and inter-marry, exerting in that aristocratic circle a refined diplomacy. It goes against them to come into touch with minute facts, especially with such facts as mental maladies for example: they would be afraid of making their hands dirty. Briefly, the theory which science had the right to demand from philosophy — a theory elastic and perfectible, moulded on the totality of known facts — philosophy has either not wished or not known how to give.

Naturally enough, then, the scientist has said: "Since philosophy does not require me, by any facts and arguments, to restrict in any way or confine to any

definite points the correspondence between the cerebral and the mental, I shall treat it, provisionally at any rate, as if it were perfect, as if in fact between the two there is exact equivalence or even identity. As a physiologist, with the methods at my disposal — merely external methods of observation and experiment — I see only the brain and can only deal with the brain. I shall therefore proceed *as if* thought was only a function of the brain; I shall thus be able to advance with more boldness, and have many more chances of making progress. When we do not know the limit of our right, it is well to begin by acting as though there were no limit; there will always be time to draw back." This is how the scientist has regarded it, and, could he dispense with philosophy, this is all that he would have thought and said.

But he cannot, and he does not, dispense with philosophy. As philosophers have not provided the plastic theory adaptable to the twofold experience, internal and external, which science needs, the scientist has naturally accepted from the ancient metaphysic the ready-made and systematic doctrine which accorded best with the rule of method he had found it most useful to follow. There was really no choice. The only definite hypothesis which the metaphysics of the last three centuries has bequeathed us on this point is that of a strict parallelism between soul and body, the soul translating what the body does, or the body

what the soul does, or both body and soul expressing, each in its own way, like translations of the same original in different languages, something which is neither the one nor the other. How had the philosophy of the seventeenth century been led to this conclusion? Certainly not by the study of the anatomy or physiology of the brain, sciences then hardly in existence, nor yet by the investigation of normal psychical life and mental disease. No, the hypothesis had been deduced, naturally enough, from the general principles of a metaphysics conceived, at least in a large measure, in order to give substance to the hopes of modern physics. The discoveries which followed the Renaissance, especially those of Kepler and Galileo, had revealed the possibility of bringing down some astronomical and physical problems to those of mechanics. Thence arose the idea that the whole material universe, organic and inorganic, might be an immense machine, governed by mathematical laws. And so, living bodies in general, the body of man in particular, must exactly fit into the machine, just as wheels in a clockwork mechanism; no one could do anything which was not pre-determined and mathematically calculable. Consequently, the human soul must be incapable of creating; if it exist, its successive states must be limited to translating into the language of thought and feeling the same things which the body expresses in extension and in movement. Descartes,

it is true, did not go so far: with his profound sense of reality, he preferred to allow free will a place in the world, even at the price of a slight inconsistency. And if, with Spinoza and Leibniz, this restriction disappeared, swept away by the logic of the system, if these two philosophers formulated in all its strictness the hypothesis of a constant parallelism between states of the body and states of the soul, at least they refrained from representing the soul, as a simple reflexion of the body; they would just as well have said that the body was a reflexion of the soul. They had, however, prepared the way for a Cartesianism curtailed and narrowed, according to which the mental life was only an aspect of the cerebral life, the would-be "soul" being nothing but the collection of those particular cerebral phenomena to which consciousness supervenes like a phosphorescent glow. In fact, throughout the whole of the eighteenth century, we can follow the path of this progressive simplification of the Cartesian metaphysics. In the degree that it narrowed itself, it penetrated physiology, which naturally found it a philosophy well suited to give it the confidence in itself of which it had need. And it is thus that philosophers such as La Mettrie, Helvetius, Charles Bonnet, Cabanis, whose relationship to Cartesianism is well known, brought to the science of the nineteenth century what it could best utilize of the

metaphysics of the seventeenth. Now, that scientists who today philosophize on the relation of the psychical to the physical should rally to the hypothesis of parallelism is comprehensible enough,— metaphysicians cannot be said to have offered them anything else. That scientists should prefer the parallelist theory to any other to be obtained by the same method of *a priori* construction is easy also to understand,— they find in it an encouragement to go forward. But should any of them come and tell us they are actually talking science, that it is experience that reveals a strict and complete parallelism between the cerebral and mental life —" Ah, no!" we reply: "Undoubtedly you can hold this theory, as the metaphysician holds it, but then it is no longer the scientist in you who speaks, it is the metaphysician. You are simply returning what we have lent you. We are well acquainted with the doctrine you are offering us. It comes from our workshops. It is we, philosophers, who have made it; and it is old, very old ware. It is not, indeed, worth less on that account, but it is not worth more. Give it to us for what it is, and do not pass off as a result of science, as a theory modelled on facts and capable of being remodelled on them, a dotctrine which had taken, even before the dawn of our physiology and psychology, the perfect and definitive form which reveals a metaphysical construction."

Let me try then to formulate the relation of mental to cerebral activity, such as it appears when we set aside every preconceived idea in order to take account of only actually known facts. A formula of this kind, necessarily provisional, can only claim more or less probability. But at least the probability will be susceptible of growing greater, the formula of becoming more and more exact, in proportion as the knowledge of the facts grows wider.

A close examination of the life of the mind and of its physiological accompaniment leads me to believe that common sense is right and that there is infinitely more, in a human consciousness, than in the corresponding brain. This, in general, is the conclusion to which I have come. For the detailed argument which has led me to this conclusion I must refer to *Matter and Memory,* principally the second and third chapters. It seems to me that, were one able to look inside a brain in its full activity, follow the going and coming of the atoms and interpret all they were doing, he would doubtless know something of what was going on in the mind, but he would know very little. He would know so much of the state of the soul as can be expressed in bodily gestures and attitudes and movements, he would know all that it implies in the way of actions in the course of accomplishment or simply nascent; the rest would escape him. As regards the thoughts and feelings which were being un-

rolled within the consciousness, he would be in the situation of the spectator seeing distinctly all that the actors were doing on the stage, but not hearing a word of what they were saying. Certainly the movements of the actors, their gestures and attitudes, have their ground in the play they are acting and if we know the text, we can in some measure foresee the gesture; but the reverse is not true: knowledge of the gestures tells us very little of the play, for there is much more in a play than the pantomime of the players. So, I believe if our science of cerebral mechanism were perfect, and our psychology also perfect, we should be able to divine what is happening in the brain during a definite state of mind; but I equally believe that the reverse would be impossible, since for one single condition of the brain we should have the choice of a host of equally appropriate states of mind.

Note that I do not say that *any* state of mind can correspond to a given cerebral state. Suppose you have a frame, you cannot place any picture you like in it. The frame determines something of the picture, by eliminating beforehand all which have not the same shape and size. But, provided it is correct in these respects, the picture will fit the frame. So also with the brain and consciousness. Provided the comparatively simple actions — gestures, attitudes, movements — in which a complex mental state would be materialized, are such as the brain is ready for, the mental

state will insert itself exactly into the cerebral state. But there are a multitude of different pictures which would fit the frame equally well; consequently the brain does not determine thought and, at least to a large extent, thought is independent of the brain.

The study of the facts will enable us to describe with increasing accuracy the particular aspect of mental life which alone, in my opinion, is delineated in cerebral activity. Is the mental fact our faculty of perceiving and feeling? Our body, inserted in the material world, receives stimulations, to which it must respond by appropriate movements; the brain, and indeed the cerebro-spinal system in general, is concerned with these movements, it holds the body ready for them; but perception itself is a wholly different thing. Is it our faculty of willing? The body carries out voluntary movements by means of certain mechanisms set up in the nervous system and waiting only for the signal to start them; the brain is the point where the signal is given and also where the mechanism is operated. The Rolandic zone, where voluntary movement has been localized, is in fact comparable to a signal-box, from which the signalman shunts the coming train to its proper line. It is a sort of commutator, by which a given external stimulus can be put in communication with any motor disposition whatever. But beside the organs of movement and the organ of choice, there is something different in kind — choice

itself. Lastly, is it the faculty of thinking? When we think, it is seldom that we are not talking inwardly; we are outlining or preparing, if we are not actually making, the articulate movements by which our thought is expressed, and all these must be already delineated in the brain. But the cerebral mechanism of thought is not, in my view, limited to this. Besides these internal movements of articulation, which are moreover not indispensable, there is something much more subtle, which is essential. I mean those nascent movements which translate symbolically the thousand successive directions of the thought. Remember that real concrete living thought is something of which psychologists have so far told us very little, because it is very ill adapted to internal observation. What is usually studied under this head is not so much thought itself as an artificial imitation of it obtained by putting together images and ideas. But with images, and even with ideas, you can no more reconstitute thinking than with positions you can make movement. The idea is a halt of thought; it arises when the thinking, instead of continuing its own train, makes a pause or is reflected back on itself. It is like the heat that produces itself in the projectile which encounters an obstacle. But it was no more a part of our thought, whilst we were thinking, than the heat was to be found in the projectile before the stop. Try, for example, by piecing together the ideas

"heat," "production" and "projectile," and intercalating the ideas "inwardness" and "reflexion" expressed in the words "in" and "itself," to reconstitute the thought I just expressed in the sentence "heat produces itself in the projectile." You will see that it is impossible, that the thought translated by the sentence is an indivisible movement, and that the ideas corresponding to each of the words are simply the images or concepts which would arise in the mind at each moment of the thinking *if* the thinking halted; but it does not halt. Put aside, then, artificial reconstructions of thinking; consider thinking itself; you will find directions rather than states, and you will see that thinking is essentially a continual and continuous change of inward direction, incessantly tending to translate itself by changes of outward direction, I mean by actions and gestures capable of outlining in space and of expressing metaphorically, as it were, the comings and goings of the mind. Of these movements, sketched out or even simply prepared, we are most often unaware, because we have no interest in knowing them; but we have to notice them when we try to seize hold of our thought in order to grasp it all living and make it pass, still living, into the soul of another. The words may then have been well chosen, they will not convey the whole of what we wish to make them say if we do not succeed by the rhythm, by the punctuation, by the relative lengths of the sentences and

parts of the sentences, by a particular dancing of the sentence, in making the reader's mind, continually guided by a series of nascent movements, describe a curve of thought and feeling analogous to that we ourselves describe. In this consists the whole art of writing. It is somewhat like the art of the musician; but do not believe that such music is simply addressed to the ear, as is usually supposed. A foreigner, however trained his ear may be in music, will not recognize the difference between the prose we find musical and that which is not, between what is perfectly written in our language and what is but approximately so,— evident proof that we are dealing with something quite other than a material harmony of sounds. The truth is that the writer's art consists above everything in making us forget that he is using words. The harmony he seeks is a certain correspondence between the comings and goings of his mind and the phrasing of his speech, a correspondence so perfect that the waves of his thought, borne by the sentence, stir us sympathetically, and the words, taken individually, no longer count: there is nothing left but the flow of meaning which runs through the words, nothing but two minds which, without intermediary, seem to vibrate directly in unison with one another. The rhythm of speech has here, then, no other object than that or reproducing the rhythm of the thought: and what can the rhythm of the thought be but the rhythm of the scarcely con-

scious nascent movements which accompany it? These movements, by which thought continually tends to externalize itself in actions, are clearly prepared and, as it were, performed in the brain. It is this motor accompaniment of thought, and not the thought itself, that we should probably perceive if we could penetrate into a brain at work.

In other words, thought is directed towards action, and when it does not end in a real action, it sketches out one or several virtual, simply possible, actions. These real or virtual actions, which are the diminished and simplified projection of thought in space and which mark its motor articulations, are what is outlined of thought in the cerebral substance. The relation of the brain to thought is then complex and subtle. Were you to ask me to express it in a simple formula, necessarily crude, I should say that the brain is an organ of pantomime, and of pantomime only. Its part is to play the life of the mind, and to play also the external situations to which the mind must adapt itself. The work of the brain is to the whole of conscious life what the movements of the conductor's baton are to the orchestral symphony. As the symphony overflows the movements which scan it, so the mental life overflows the cerebral life. But the brain,— precisely because it extracts from the mental life whatever it has that may be played in movement, whatever is materializable,— precisely because it constitutes thus

the point of insertion of mind in matter,— secures at every moment the adaptation of the mind to circumstances, continually keeping the mind in touch with the realities. The brain is then, strictly speaking, neither an organ of thought nor of feeling nor of consciousness; but it keeps consciousness, feeling and thought tensely strained on life, and consequently makes them capable of efficacious action. Let us say, if you will, that the brain is the organ of attention to life.

That is why there need be but a slight modification of the cerebral substance for the whole mind to be affected. I have referred to the effect of certain toxins on the consciousness, and more generally to the influence of cerebral disease on the mental life. In these cases is it the mind itself, and not rather the mechanism of the insertion of the mind in things, which is deranged? When a madman raves, his reasoning may conform to the strictest logic; hearing a man under the delusion of persecution, you might sometimes say that it is by an excess of logic that he errs. What is wrong is not that he reasons badly, but that his reasoning has lost contact with actuality as when one is dreaming. Let us suppose, as appears likely, that the disease has been caused by a certain intoxication of the cerebral substance. We must not suppose that the poison has gone to search out the reasoning in such or such cells of the brain, nor consequently that there were, at such or such points of the brain, atomic

movements corresponding to the reasoning. No, it is more probable that the whole brain is affected, just as a badly tied knot may make the whole rope slack. But just as a very slight loosening of the cable is enough to set the boat dancing on the waves, so even a slight modification of the whole cerebral substance can make the mind, losing its contact with the material things on which it is accustomed to lean, feel the reality fall away from under it, totter and be seized with giddiness. Indeed, it is by a feeling comparable to the sensation of giddiness that madness in many cases makes its first appearance. The patient feels bewildered, as if he were losing his way. He will tell you that the material objects have no longer for him their former solidity, relief and reality. In fact, a loosening of the *tension,* or rather of the *attention* to life, which keeps the mind fixed on the part of the material world which concerns its action, such is the only *direct* result of cerebral derangement. For the brain is the assemblage of all the contrivances which allow the mind to respond to the action of things by motor reactions, effected or simply nascent, which secure by their accuracy the perfect insertion of the mind in reality.

Such, in broad outline, seems to be the relation of the mind to the body. It is impossible for me here to enumerate the facts and arguments on which this con-

ception is founded. And yet I cannot expect you to take my word. What am I to do? There is one way, I think, in which it is possible to dispose finally of the theory I am opposing; and that is by showing that, taken literally, the hypothesis of an equivalence between the cerebral and the mental is self-contradictory, that it requires us to adopt two opposite points of view at one and the same time and use two systems of notation simultanenously when they are mutually exclusive. I attempted some years ago to prove this; but although the argument is simple enough, it involves certain preliminary considerations concerning realism and idealism which would take some time to expound. I admit, moreover, that it is possible to give the theory of equivalence an appearance of intelligibility when we cease to push it in the materialist direction. And then again, though pure reasoning may suffice to prove the theory untenable, it does not and cannot tell us what to put in its place. So that it is to experience we have to address ourselves, as I have already hinted. But how could we review here the normal and pathological facts of which we must take account? To examine them all is impossible; to examine thoroughly any one of them would still be too long. The only way I see out of the difficulty is selecting, from among all the known facts, those which seem most favourable to the theory of parallelism. These without question are the facts of memory; in these

alone does the theory seem to find the beginning of verification. If, then, I could indicate in a few words how a thorough investigation of these facts would result in invalidating the theory which has appealed to them and in confirming that which I am putting forward, something at least would have been gained. It would not be the complete demonstration, far from it; but we should at least know where to seek for it. Let us try.

The only function of thought which it has been possible actually to locate in the brain is memory — the memory of words, to be exact. I drew your attention, in the beginning of this lecture, to the manner in which the study of diseases affecting speech has led to localizing, in certain convolutions of the brain, certain forms of verbal memory. Since Broca, who was the first to demonstrate that a lesion of the third left frontal convolution resulted in the forgetting of articulate speech movements, a theory of aphasia and its cerebral conditions, more and more complicated, has been laboriously built up. On this theory I should have much to say. It has been opposed lately by investigators of acknowledged competence, who base their arguments on a closer observation of the cerebral lesions which accompany maladies affecting speech. I myself, nearly twenty years ago (I mention the fact, not to make a merit of it, but in order to show that pure introspection may achieve results where methods

believed more efficient fail), by analysis of the mechanism of speech and thought alone, was led to declare that the doctrine then considered unquestionable at least required revision. However, I shall leave all this aside. There is one point at least on which we all agree, namely, that diseases of word-memory are caused by lesions of the brain more or less clearly localizable. Let us see, then, how this fact is interpreted by the doctrine according to which thought is a function of the brain, and more generally by the theory of those who believe in a parallelism or in an equivalence between the work of the brain and that of thought.

Nothing is simpler than their explanation. The recollections are said to be there, stored in the brain in the form of modifications impressed on particular groups of anatomical elements: if they disappear from the memory, it is because the cells in which they lie are altered or destroyed. We spoke just now of sensitive plates and of phonograms. It is this sort of comparison we find in all the cerebral explanations of memory. Impressions made by external objects are supposed to subsist in the brain as it were on a sensitive plate or a phonographic disk. But, when we look more closely, we see how fallacious these comparisons are. If, for example, the visual recollection of an object were really an impression left by that object on the brain, there would not be one recollection of an

object, there would be thousands or even millions of them; for the simplest and most stable object changes its form, its size and its shade of colour, according to the point of view from which it is perceived. Unless, then, I condemn myself to a position absolutely fixed when looking at it, unless my eye remains immovable in its socket, countless images in no way superposable will be outlined successively on my retina and transmitted to my brain. And what must the number of the images be if the visual image is of a person, whose expression changes, whose body is mobile, whose clothing and environment are different each time I see him? Yet it is unquestionable that my consciousness presents to me a unique image, or, what amounts to the same, a practically invariable recollection of the object or person; evident proof that there is something quite different here from mechanical registration. Note that we might say just as much of the auditory recollection. The same word, pronounced by different persons, or by the same person at different times in different sentences, gives phonograms which do not coincide with one another. How, then, can the recollection of the sound of a word — a recollection which is relatively invariable and unique — be comparable to a phonogram? This consideration alone would be enough in itself to throw suspicion on the theory which attributes diseases affecting the memory of words to an alteration or a destruction of the recollections them-

selves, automatically registered by the cerebral cortex.

But let us see what actually occurs in these diseases. When the cerebral lesion is severe, and the word-memory is deeply affected, it may happen that a more or less vigorous stimulus, an emotion, for example, will suddenly bring back the recollection which had seemed lost for ever. Could this be possible, if the recollection had been originally deposited in the cerebral matter which has suffered injury or destruction? Things happen much more as if the brain served to *recall* the recollection, and not to store it. The sufferer from aphasia becomes incapable of finding the word when he wants it; he seems to be feeling his way all around it, lacking the desired power of putting his finger on the exact point he wants; in the psychological domain, indeed, the external sign of strength is always precision. But the recollection, to all appearance, is there; and sometimes, when replacing by paraphrases the word which he thinks lost, the patient may actually bring the right word into one of them. What has become enfeebled in his case is that " adjustment to the situation " which the cerebral mechanism is contrived to secure. Or, to speak more precisely, what is affected is the faculty of evoking the recollection by sketching in advance the movements in which the recollection, if it were there, would be prolonged. When we have forgotten a proper name, how do we set about recalling it? We try with all

the letters of the alphabet one after the other; we pronounce them inwardly first of all, then, if that is not enough, out loud; we thus place ourselves in turn in all the various motor dispositions between which we have to choose. Once the desired attitude is found, the sound of the word sought slips into it, as into a frame prepared to receive it. It is this play, real or virtual, actually performed or merely sketched out, that the cerebral mechanism has to secure. And it is this, probably, that the disease attacks.

Consider now what takes place in progressive aphasia, that is to say, when the loss of words goes on increasing. In most cases, the words then disappear in a definite order, as if the disease knew grammar. The first to suffer eclipse are proper nouns, then common nouns, then adjectives and finally verbs. Now this, no doubt, at first sight appears to confirm the hypothesis of an accumulation of recollections in the cerebral substance. Proper names, common names, adjectives and verbs will be said to form, so to speak, so many superposed layers, and the lesion to destroy these layers one after the other. Yes, but the disease may be due to the most different causes, may assume the most varied forms, may break out at any point whatever in the cerebral region concerned and spread in any direction, yet the order in which recollections disappear is always the same. Would this be possible, if it were the recollections themselves

which the disease attacks? The fact must therefore have a quite different explanation. Here is the very simple interpretation which I offer you. First, if proper names disappear before common names, these before adjectives, and adjectives before verbs, the reason is that it is harder to remember a proper name than a common name, a common name than an adjective, and an adjective than a verb, and that the function of recall, in which evidently the brain is concerned, must confine itself to the more easy cases according as the lesion of the brain increases in severity. But why is there greater or less difficulty in the recall of the different classes of words? And why are the verbs of all words those we have the least trouble in evoking? It is simply because verbs express actions, and actions may be mimicked. The verb is directly expressible in action, the adjective only by the mediation of the verb, the substantive by the double mediation of the adjective which express one of its attributes and the verb implied in the adjective, the proper name by the triple mediation of the common noun, the adjective and also the verb: therefore, according as we go from the verb to the proper noun, we get farther and farther away from directly imitable action, action the body can play, and a more and more complicated device becomes necessary in order to symbolize in movement the idea expressed by the required word. Now, since the task of preparing these movements

falls to the brain, and since the functioning of the brain is diminished, reduced and simplified in proportion to the extent and severity of the lesion in the region concerned, it is not surprising that an alteration or destruction of tissues, making the evocation of proper and common nouns as well as of adjectives impossible, should still allow that of the verb to remain. Here, as elsewhere, facts seem to point to the cerebral activity as being the pantomime part of the mental activity, and not in any sense its equivalent.

But if the recollection has not been stored by the brain, where then has it been preserved? Strictly speaking, I am not sure that the question "where" can have a meaning when we ask it of something different from a body. Sensitive plates are stored in a box, phonographic rolls in cases; but why should recollections, which are neither visible nor tangible, need a container, and how could they have one? I will however accept, if you insist, but in a purely metaphorical sense, the idea of a container in which recollections are lodged, and I say then quite frankly they are in the mind. I make no hypothesis, I do not call in aid a mysterious entity, I confine myself to observation. For there is nothing more immediately given, nothing more evidently real, than consciousness, and mind *is* consciousness. Now, consciousness signifies, before everything, memory. At this moment that I am conversing with you, I pronounce the word

"conversation." Clearly my consciousness presents the word all at once, otherwise it would not be a whole word, and would not convey a single meaning. Yet, when I pronounce the last syllable of the word, the three first have already been pronounced; they are past with regard to the last one, which must then be called the present. But I did not pronounce this last syllable "tion" instantaneously. The time, however short, during which I uttered it is decomposable into parts, and all of these parts are past in relation to the last among them. This last would be the definitive present, were it not, in its turn, decomposable. So that, however you try, you cannot draw a line between the past and the present, nor consequently between memory and consciousness. To make the brain the depository of the past, to imagine in the brain a certain region in which the past, once past, dwells, is to commit a psychological error, to attribute a scientific value to a distinction entirely practical, for there is no exact moment when the present becomes the past, nor consequently when preception becomes recollection. As a matter of fact, when I pronounce the word "conversation," there is present in my mind not only the beginning, the middle, and the end of the word, but also the words which preceded it and all the beginning of the sentence; otherwise I should have lost the thread of my speech. Now, if the punctuation of my speech had been different, my sentence might

have begun sooner; it might, for example, have embraced all the preceding sentence, and my "present" would have been still more extended into the past. Push the argument to its limit, suppose that my speech had been lasting for years, since the first awakening of my consciousness, that it had been carried on in one single sentence, and that my consciousness were sufficiently detached from the future, disinterested enough in action, to be able to employ itself entirely in embracing the total meaning of the sentence: then I should no more seek the explanation of the integral preservation of this entire past than I seek the explanation of the preservation of the three first syllables of "conversation" when I pronounce the last syllable. Well, I believe that our whole psychical existence is something just like this single sentence, continued since the first awakening of consciousness, interspersed with commas, but never broken by full stops. And consequently I believe that our whole past still exists. It exists subconsciously, by which I mean that it is present to consciousness in such a manner that, to have the revelation of it, consciousness has no need to go out of itself or seek for foreign assistance; it has but to remove an obstacle, to withdraw a veil, in order that all that it contains, all in fact that it actually is, may be revealed. Fortunate are we to have this obstacle, infinitely precious to us is the veil! The brain is what secures to us this advantage. It keeps our attention

fixed on life; and life looks forward; it looks back only in the degree to which the past can aid it to illumine and prepare the future. To live is, for the mind, essentially to concentrate itself on the action to be accomplished. To live is to be inserted in things by means of a mechanism which draws from consciousness all that is utilizable in action, all that can be acted on the stage, and darkens the greater part of the rest. Such is the brain's part in the work of memory: it does not serve to preserve the past, but primarily to mask it, then to allow only what is practically useful to emerge through the mask. Such, too, is the part the brain plays in regard to the mind generally. Extracting from the mind what is externalizable in movement, inserting the mind into this motor frame, it causes it to limit its vision, but also it makes its action efficacious. This means that the mind overflows the brain on all sides, and that cerebral activity responds only to a very small part of mental activity.

But this also means that mental life cannot be an effect of bodily life, that it looks much more as if the body were simply made use of by the mind, and that we have, therefore, no reason to suppose the body and the mind united inseparably to one another. I should not think of attacking, during the few minutes that are left to us, the most formidable problem that humanity can face. But still less should I think of stealing away from it. Whence do we come? What

are we doing here? Whither are we bound? If philosophy could really offer no answer to these questions of vital interest, if it were incapable of gradually elucidating them as we elucidate problems of biology or history, if it were unable to forward the study of them through an experience ever more profound and a vision of reality ever more piercing, if it were bound to be nothing better than an endless tournament between those who affirm and those who deny immortality by deductions from the hypothetical essence of the soul or of the body, we could well indeed say,— to adopt a phrase of Pascal,— that the whole of philosophy is not worth an hour's trouble. True, immortality cannot indeed be proved experimentally, for experience can only be experience of a limited duration; and when religion speaks of immortality, it appeals to revelation. But it would be something, it would indeed be a great step forward, were we able to establish on the ground of experience the possibility, much more were it the probability, of survival for a time. The question whether this time is finite or infinite could be left outside the domain of philosophy. Well, reduced to these modest proportions, the philosophic problem of the destiny of the soul does not seem to me in the least insoluble. Here is a brain which works; and here is a consciousness which feels, thinks and wills. If the work of the brain corresponded to the totality of the consciousness, if there

were equivalence between the cerebral and the mental, consciousness might be bound up with the destiny of the brain and death might be the end of all. Experience, at any rate, would not speak to the contrary, and the philosopher who affirms survival would then have to support his theory by some metaphysical construction — usually a fragile thing. But if, as I have tried to show, the mental life overflows the cerebral life, if the brain does but translate into movements a small part of what takes place in consciousness, then survival becomes so probable that the onus of proof falls on him who denies it rather than on him who affirms it; for the only reason we can have for believing in the extinction of consciousness at death is that we see the body become disorganized, that this is a fact of experience, and the reason loses its force if the independence of almost the whole of consciousness with regard to the body has been shown to be also a fact of experience. In thus treating the problem of survival, in bringing it down from the heights on which traditional metaphysics has placed it, in transporting it into the field of experience, we are no doubt renouncing the immediate finding of a complete and radical solution. But what should we do? We have to choose, in philosophy, between the method of pure reasoning, which aims at a complete and decisive result, unable to be perfected since it is supposed to be perfect, and an empirical method, content with approximate results

which can be endlessly corrected and enlarged. The first method, because it aims at making us immediately certain, condemns us to remain always in the simply probable or rather in the purely possible, for it is rare that it cannot serve to demonstrate indifferently either of two opposed theories equally coherent and equally plausible. The second aims first at simple probability, but since it works on a plane where probability may increase indefinitely, it brings us gradually to a state practically equivalent to certainty. Between these two ways of philosophizing I have long since made my choice. I shall be happy if, in however small a degree, I have helped to make yours.

III

"PHANTASMS OF THE LIVING" AND "PSYCHICAL RESEARCH"

Presidential Address to the Society for Psychical Research, London, May 28, 1913.

LET me say at once how much I appreciate the great honour you have done me in electing me President of your Society. I am conscious I have done nothing to deserve it. It is only by reading that I know anything of the phenomena with which the Society deals; I have seen nothing myself, I have examined nothing myself. How is it, then, that you have come to choose me to succeed the eminent men who have occupied in turn the presidential chair, all experts in these studies? I suspect that there is in this a case of telepathy or clairvoyance, that you felt from afar the interest I was taking in your researches, and that you perceived me, across the two hundred and fifty miles of space, attentively reading your *Proceedings* and following with keen curiosity your work. The ingenuity, the penetration, the patience, the tenacity you have shown in the exploration of the *terra incognita* of psychical phenomena have always appeared to me truly admirable. But still more than the ingenuity and the penetra-

tion, still more than the unwearying perseverance with which you have continued your course, I admire the courage which it has required, especially during the first years, to struggle against the prejudices of a great part of the scientific world, and to brave the mockery which strikes fear into the boldest breast. This is why I am proud — prouder than I can say — to have been elected President of the Society for Psychical Research. I have read somewhere the story of a sub-lieutenant whom the chances of the battle,— the death or wounds of his superiors,— had raised to the honour of the command of his regiment:— all his life he thought of it, all his life he talked of it, the memory of those few hours suffused his whole existence. I am that sub-lieutenant, and I shall always pride myself on the happy chance which has set me — not for a few hours, but for some months — at the head of a valiant regiment.

How are we to explain the prejudice there always has been, and still is, against psychical science? True, it is more often the smatterer than the scientist who takes upon himself to condemn your researches "in the name of Science." Physicists, chemists, physiologists, physicians belong to your society, and besides these there are an increasing number of men of science who, without belonging to you, are interested in the work you are doing. Yet it is none the less true that there are scientific workers of repute, men ready to

welcome any laboratory work, however restricted and minute it be, who yet dismiss with a foregone conclusion what you bring forward and reject outright all you have done. What is their ground for this? It is on that point I will speak first. Far from me is the intention of criticizing their criticism for the sake of criticizing. It seems to me that in philosophy the time given up to refutation is generally time lost. Of the many objections raised by so many thinkers against one another, what remains? Nothing, or next to nothing. That which counts, that which lasts, is the positive truth we bring out; the true idea pushes out the false one by its mere weight and thus proves to be, without our refuting anybody, the best of refutations. But quite another thing is here in question than either refuting or criticizing. I want to show that behind the prejudices of some, the mockery of others, there is, present and invisible, a certain metaphysic unconscious of itself,— unconscious and therefore inconsistent, unconscious and therefore incapable of continually remodelling itself on observation and experience as every philosophy worthy of the name must do,— that, moreover, this metaphysic is natural, due at any rate to a bent contracted long ago by the human mind, and this explains its persistence and popularity. I would tear away the mask which hides it, go right at it and see what it is worth. But, before doing so and thus coming to the subject of your research, I

wish to say a word on your method, a method which I can well understand is disconcerting to a certain number of men of science.

There is nothing more displeasing to the professional student than to see introduced into a science, of the same order as his own, methods of research and verification from which he has himself always carefully abstained. He fears the contagion. Quite legitimately, he holds to his method as the workman to his tools. He loves it for itself, and not only for what it does. It was William James, I think, who defined the difference between the professional and the amateur by saying that the latter interests himself especially in the result obtained, the former in the way in which he obtains it. Well, the phenomena with which you are occupied are undeniably of the same kind as those which form the subject-matter of natural science, whilst the method you follow, and are obliged to follow, has often no relation to that of any of the natural sciences.

I say they are facts of the same kind. I mean by this that they are subject to laws, and that they are capable of being repeated indefinitely in time and in space. They are not facts like those, for instance, with which the historian deals. History does not repeat itself. The battle of Austerlitz was fought once, and it will never be fought again. It being impossible that the same historical conditions should

ever be reproduced, the same historical fact cannot be repeated; and as a law expresses necessarily that to certain causes, always the same, there will correspond effects, also always the same, history, strictly speaking, has no bearing on laws, but on particular facts and on the no less particular circumstances in which they were brought to pass. The only question, here, is to know if the event did really take place at such and such a definite moment of time and at such and such a determinate point of space, and in what way it was brought about. On the contrary, a veridical hallucination,— the apparition, for instance, of a sick or dying man to a relation or friend far away, it may be at the antipodes,— is a fact which, if it be real, is unquestionably the manifestation of a law analogous to physical, chemical and biological laws. Suppose, let us say, that this phenomenon were due to the action of the consciousness of one of the two persons on the consciousness of the other, that therefore some minds were able to communicate without any visible intermedium, that there were what you call "telepathy." If telepathy be a real fact, it is a fact capable of being repeated indefinitely. I go further: if telepathy be real, it is possible that it is operating at every moment and everywhere, but with too little intensity to be noticed, or else in such a way that a cerebral mechanism stops the effect, for our benefit, at the very moment at which it is about to

clear the threshold of consciousness. We produce electricity at every moment, the atmosphere is continually electrified, we move among magnetic currents, yet for thousands of years millions of human beings have lived who never suspected the existence of electricity. We might very well have gone on without perceiving it, and it may be that this is now our case with telepathy. But what is indisputable in any case is that if telepathy be real, it is natural, and that whenever the day comes that we know its conditions, it will no more be necessary to wait for a "phantasm of the living" in order to obtain a telepathic effect than it is necessary for us now, if we wish to see an electric spark, to wait until it pleases the heavens to make it appear during a thunderstorm.

Here, then, is a phenomenon which it would seem ought, by reason of its nature, to be studied in the way we study a physical, chemical or biological fact. It is not so. You are obliged to begin with an entirely different method, one which stands midway between that of the historian and that of the magistrate. Did the veridical hallucination take place in the past? — You study documents, you criticize them, you write a page of history. Is it a fact of today? — You proceed to a kind of judicial inquiry; you examine the witnesses, confront them with one another, and weigh the value of their evidence. For my part, when I bring to mind the results of the admirable

inquiry you have conducted continually during more than thirty years; when I think of all the precautions you have taken to avoid error; when I see that, as a rule, you only took into account cases in which the hallucination had been related by the percipient to some other person or persons, often even noted down in writing, before it had been found veridical; when I bear in mind the enormous number of the facts, and especially their resemblance, the family likeness between them, the agreement of so many witnesses independent of one another, all examined, their testimony weighed and submitted to criticism: I am led to believe in telepathy, just as I believe in the defeat of the Invincible Armada. My belief has not the mathematical certainty which the demonstration of Pythagoras's theorem gives me, it has not the physical certainty which the verification of Galileo's law brings me, but it has at least all the certainty which we can obtain in historical or judicial matters.

But this is just what is disconcerting to so many minds. Without entirely realizing that this is the cause of their repugnance, they find it strange that we should have to treat historically or judicially facts which, if they be real, surely obey laws, and ought then, it seems, to be amenable to the methods of observation and experiment used in the natural sciences. Arrange for the fact to be produced in a laboratory, they will receive it gladly; till then, they hold it sus-

pect. Just because "psychical research" cannot proceed like physics and chemistry, they conclude it is not scientific; and as the "psychical phenomenon" has not yet taken that simple and *abstract* form which opens to a fact access to the laboratory, they are pleased to declare it unreal. Such, I think, is the "subconscious" reasoning of some men of science.

I discover the same feeling, the same disdain for the concrete, at the root of the objections that are raised against many of your conclusions. I will cite only one example. Some time ago, I was at a dinner party at which the conversation happened to turn on the phenomena which your Society investigates. There was an eminent physician present, one of our leading men of science. After listening attentively, he joined in the conversation, expressing himself, as nearly as I remember, in these words: "All that you are saying interests me very much, but I ask you to reflect before drawing a conclusion. I also myself know an extraordinary fact. I can guarantee its authenticity, for it was related to me by a lady highly intellectual, whose word inspires me with absolute confidence. The husband of this lady was an officer. He was killed in the course of an engagement. Well, at the very moment when the husband fell, the wife had the vision of the scene, a clear vision, in all points conformable to the reality. You may perhaps conclude from that, as she herself did, that it was a case

of clairvoyance or of telepathy? . . . You forget one thing, however, and that is that it has happened many times that a wife has dreamed that her husband was dead or dying, when he was quite well. We notice cases in which the vision turns out to be true, but take no count of the others. Were we to make the full return, we should see that the coincidence is the work of chance."

The conversation turned off in I know not what direction; there was no question of philosophical discussion, it was neither the time nor the place for it. But, when we left the table, a young girl who had been listening attentively came and said to me, "It seems to me that the doctor argued wrongly just now. I do not see what the fallacy in his argument was, but there must have been a fallacy." Yes, indeed, there was a fallacy! The child was right and the learned doctor wrong. He shut his eyes to what was *concrete* in the phenomenon. He argued thus: "When a dream or an hallucination informs us that a relation is dead or dying, either it is true or it is false; either the person dies or does not die. And consequently, if the vision proves true, it is necessary, in order to be sure that it is not an effect of chance, to have compared the number of true cases with the number of false cases." He did not see that his argument rested on a substitution; he had replaced the description of the concrete and living

scene,— the officer falling at a given moment, in a definite spot, with such and such soldiers around him, — by this abstract and dead formula:—"The lady's case was one of the true class, and not one of the false." Ah, if we accept this transposition into the abstract, we must then indeed compare *in abstracto* the number of true cases, with the number of false, and we shall find perhaps that there are more false than true, and the doctor will then be right. But this abstraction consists in neglecting the essential,— the *picture* which the lady perceived, and which was found to reproduce a complicated scene very distant from her. Do you suppose that a painter, composing the picture of a battle and trusting to his fancy, could be so well favoured by chance as to find that he had produced the likeness of real soldiers, present that day at a battle, and that they had stood there in the attitudes he had portrayed? Evidently not. The calculus of probabilities, to which the doctor made appeal, would in this case show that it is impossible. For a scene in which definite persons take definite attitudes in a thing unique of its kind; the lineaments of a human face are unique in their kind: therefore each personage — much more the scene which includes them — is decomposable into an infinity of details all independent of one another. So that an infinite number of coincidences is needed in order that chance should make a fancied scene the reproduction of a real scene (and even then

we leave out of account the coincidence *in time*, that is, the fact that two scenes whose content is identical have chosen for their apparition the same moment). In other words, it is mathematically impossible that a picture drawn from the painter's imagination should portray part of a battle such as it was. Well, the lady who had the vision of a part of a battle was in the situation of that painter; her imagination executed a picture. If the picture was the reproduction of a real scene, it must, by every necessity, be because she perceived that scene or was in communication with a consciousness that perceived it. I do not need to compare the number of "true cases" with the number of "false cases"; statistics have nothing to do with it; the unique case which is presented to me is sufficient, provided I take it with all that it contains. And so, if it had been an occasion to discuss with the doctor, I should have said to him: "I do not know if the story which was told you is worthy of credence; I do not know if the lady had the vision of the actual scene which was going on, at the time, far away from her; but if this were proved to me, if I could be sure that even the countenance of one soldier unknown by her, present at the scene, had appeared to her such as it was in reality,— then, even if it should be proved to me that there had been thousands of false visions, and even though there had never been a veridical hallucination except this one, I should hold the reality

of telepathy — or more generally the possibility of perceiving objects and events which our senses, with all the aid which instruments can bring them, are incapable of attaining — to be strictly and unquestionably established."

But enough on this point; let me come at once to the deep-seated cause which, in directing the activity of workers in science exclusively in another direction, has until now retarded "psychical research."

One is at times astonished that modern science should be disdainful of the facts which interest you, when it ought, being experimental, to welcome whatever is matter of observation and experiment. But we must understand the experimental character of modern science. Modern science has created the experimental method; so much is certain; but that is not equivalent to saying that it has enlarged in all directions the field of experience on which one worked before. Quite the contrary, it has often narrowed it in more than one point; moreover, it is in this that its force lies. Long before modern science, men observed and even experimented. But they observed at random and in no definite direction. In what did the creation of the "experimental method" consist? In taking certain processes of observation and experiment which already existed and, instead of applying them in all possible directions, making them converge on one single point, *measurement*,— the measurement of such

or such a variable magnitude which we suspect may be a function of such or such other variable magnitudes, equally measurable. "Law," in the modern sense of the word, is rightly the expression of a constant relation between magnitudes which vary. Modern science, then, is the offspring of mathematics, begotten on the day when algebra had acquired sufficient force and pliability to be able to enfold reality, to draw it into the net of its calculations. First appeared astronomy and mechanics, under the mathematical form which the moderns have given them. Then was developed physics — a physics equally mathematical. Physics gave rise to chemistry, this also being founded on measurements, on comparisons of weights and volumes. After chemistry came biology, which, indeed, is still without mathematical form and seems far from acquiring it, but which seeks none the less, by means of physiology, to bring down the laws of life to those of chemistry and physics,— indirectly, then to those of mechanics. So that, in short, our science always tends to mathematics as to an ideal. It seems essential to it to measure, and wherever calculation is not yet applicable, wherever it must limit itself to description or analysis, it manages to set before itself only the side which later may become amenable to measurement.

Now, it is of the essence of mental things that they do not lend themselves to measurement. The first movement of modern science was bound, then, to

be to find out whether it was not possible to substitute, for the phenomena of the mind, phenomena which are measurable and which could be their equivalent. Now we see, as a fact, that consciousness has some relation to the brain. So modern science seized upon the brain, took hold of the cerebral fact,— the nature of which, indeed, we do not know, but we do know that it must finally resolve itself into movements of molecules and atoms, that is to say, into facts of a mechanical order,— and determined to consider the cerebral as the equivalent of the mental. All our mental science, all our metaphysics, from the seventeenth century until the present day, proclaims this equivalence. We speak of thought and of the brain indifferently; either we consider the mental a simple " epiphenomenon " of the cerebral, as materialism does, or we put the mental and the cerebral on the same level, regarding them as two translations, in different languages, of the same original. In short, the hypothesis that there is a strict *parallelism* between the cerebral and the mental appears eminently scientific. Instinctively, philosophy and science tend to cast aside whatever would contradict this hypothesis or fit ill with it. And this at first sight appears to be the case with the facts which " psychical research " deals with, or at least it might be so with a good number of them.

Well, the moment has come to consider closely this hypothesis, and to see what it is worth. I will not in-

sist on the theoretical difficulties it raises. I have shown elsewhere that, taken literally, it is a self-contradiction. Moreover, it is not likely that nature has indulged in the luxury of repeating in the language of consciousness what the cerebral cortex expresses in atomic or molecular movements. For every superfluous organ atrophies, every useless function disappears. A consciousness which is only a duplicate, unable to intervene actively, would have long since disappeared from the universe, supposing it had ever been produced. Do we not see that our actions become unconscious in the degree that habit renders them mechanical? But I will not insist on these theoretical considerations. What I claim is that the facts, looked at without any prepossession, neither confirm nor even suggest the hypothesis of parallelism.

There is but one intellectual faculty which at first sight we might believe ourselves authorized by experience to speak of as definitely localized in the brain: that is memory, and more particularly word-memory. In regard to judgment, reasoning or any other act of thought, there is not the slightest reason to suppose that they are attached to intra-cerebral movements of which they would then be, so to say, the conscious underlining. But maladies that affect word-memory, or, as they are called, cases of aphasia, on the contrary do correspond with lesions of certain cerebral convolutions: so that it has been thought

possible to consider memory as a mere function of the brain, and to believe that visual, auditory, and motor recollections of words are deposited inside the cortex,— photographic plates which preserve luminous impressions, phonographic disks which are registers of sound vibrations. Examine closely the facts alleged in favour of an exact correspondence and of a kind of *adherence* of the mental to the cerebral life (I set aside, it goes without saying, sensations and movements, for the brain is certainly a sensori-motor organ) : you will see that these facts reduce themselves to the phenomena of memory, and that it is the localization of aphasia, and that localization alone, which seems to bring a beginning of experimental proof to the support of the parallelist doctrine.

Now, a closer study of the various cases of aphasia shows the impossibility of supposing that recollections are deposited in the brain on the analogy of photographic plates or phonographic records. In my view, the brain does not preserve the ideas or images of the past, it simply stores motor habits. I will not repeat here the criticism of the current interpretation of aphasia in my *Matter and Memory,* a criticism which appeared paradoxical, which went against a scientific dogma, but which the progress of pathological anatomy has come to confirm (I refer to the works of Professor Pierre Marie and of his pupils). I will confine myself to recalling to you my conclusions.

What appears to me to stand out clearly from an attentive study of the facts is that the characteristic cerebral lesions of the various forms of aphasia do not touch the recollections themselves, and consequently that there are not recollections stored in the particular regions of the cerebral cortex which the malady has destroyed. The lesions really make the *evoking* of recollections impossible or difficult; they concern the mechanism of recall, and that mechanism only. More exactly, the function of the brain in this case is to give the mind, when it has need of a recollection, the power of obtaining from the body a certain attitude, or certain nascent movements, which offer to the recollection sought for an appropriate frame. If the frame be there, the recollection will come of its own accord to insert itself into it. The cerebral organ prepares the frame; it does not furnish the recollection. That is what the maladies of word-memory teach us, and it is also what the psychological analysis of memory in general would lead us to expect.

If we turn now to the other functions of thought, the hypothesis of a strict parallelism between the mental life and the cerebral life is not what the facts would naturally suggest to us. In the work of thought in general, as in the particular case of memory, the brain appears to be charged simply with the task of impressing on the body the movements and attitudes

which *act* what the mind thinks, or what the circumstances invite it to think. I have expressed this by saying that the brain is an "organ of pantomime." Were any one able to look inside a brain in its full activity, to follow the going and coming of the atoms, and to interpret all they were doing, he would doubtless know something of what was going on in the mind, but he would know very little. He would know only just what can be expressed in bodily gestures, attitudes and movements,— what the state of the soul might contain of action in course of accomplishment or simply nascent; the rest would escape him. As regards the thoughts and feelings which were being unrolled within the consciousness, he would be in the situation of a spectator seeing distinctly all that the actors were doing on the stage, but not hearing a word of what they were saying. Or yet again, he would be like a person who could only know a symphony by the movements of the conductor directing the orchestra. Indeed, the cerebral phenomena are to the mental life just what the gestures of the conductor are to the symphony: they mark out the motor articulations, they do nothing else. In other words, we should find nothing of the higher workings of the mind within the cerebral cortex. Except its sensory functions, the brain has no other part than to *play,* in the full meaning of the term, the mental life.

I recognize, however, that this "pantomime" is

of primary importance. It is by it that we insert ourselves in reality, that we adapt ourselves to it, that we respond to the call of circumstances by appropriate actions. If consciousness is not a function of the brain, at least the brain maintains consciousness fixed on the world in which we live; it is the organ of attention to life. That is why a cerebral modification, even a slight one,— a passing intoxication by alcohol or opium, for example (all the more a lasting intoxication like those which are probably often the explanation of insanity), may involve a complete perturbation of the mental life. It is not that the mind is directly affected. It is not necessary to believe, as it often is believed, that the poison has sought out a particular mechanism in the cerebral cortex which is the material aspect of a particular reasoning, that it has deranged this mechanism, and that it is on that account that the patient raves. But the effect of the lesion is that the mechanism is thrown out of gear, and thought can no longer insert itself exactly in things. An insane person, suffering from the delusion that he is being persecuted, can still reason very logically; but his reasoning is out of line with reality, outside reality,— as we reason in a dream. To direct our thought towards action, to bring it to prepare the act that the circumstances call for,— it is for this that our brain is formed.

But in doing this it canalizes, and also it limits, the mental life. It prevents us from turning our

eyes to right and left, and even, for most part of our time, behind; it would have us look right before us in the direction in which we have to go. Is this not already clear in the operation of the memory? Many facts seem to indicate that the past is preserved even down to its slightest details, and that there is no real forgetting. You have heard of persons resuscitated from drowning or hanging, who have said that during a moment they had the panoramic vision of the totality of their past. Other examples show that asphyxia has nothing to do with the phenomenon, although it has been said that it has. It has occurred to Alpine climbers slipping on a precipice, to soldiers seeing the guns fired at them and feeling themselves lost. The truth is that our whole past is always present behind us, and to perceive it we have but to look back; only, we cannot and we must not look back. We must not, because our end is to live, to act, and life and action look forward. We cannot, because the cerebral mechanism is fashioned to this end,— to mask from us the past, to let at each moment only so much pass through as will throw light on the present situation and favour our action: it is by this very obscuring of all our recollections, except only that which is of interest and which our body already outlines by its "pantomime," that it *recalls* this useful recollection. Should, however, the attention to life grow weak for a moment (I do not mean voluntary attention, which

is momentary and individual, but that continuous attention common to us all, imposed by nature, which we may call "racial attention"), then our mind, which has of force been kept till then looking forward, loses the tension which strains it and by the recoil is made backward-looking; it surveys its whole history. The panoramic vision of the past is due, then, to a sudden *disinterestedness in life* born of the sudden conviction that the moment is the moment of death. Therefore, up to then the business of the brain, so far as it is the organ of memory, has been to keep the attention fixed on life by usefully contracting the field of consciousness.

But what I say of memory is equally true of perception. I will not enter here into details. It will be enough if I say that everything is obscure and even incomprehensible in perception if we regard the cerebral centres as organs capable of transforming material vibrations into conscious states; while, on the contrary, all becomes clear if we see in those centres (and in the sensory contrivances with which they are connected) instruments of selection charged with choosing, in the immense field of our virtual perceptions, those which are to be actualized. Leibniz said that each monad, and therefore *a fortiori* each of those monads that he calls minds, carries in it the conscious or unconscious idea of the totality of the real. I should not go so far; but I think that we perceive virtually

many more things than we perceive actually, and that here, once more, the part that our body plays is that of shutting out from consciousness all that is of no practical interest to us, all that does not lend itself to our action. The sense organs, the sensory nerves, the cerebral centres canalize, then, the influences from without, and thus mark the various directions in which our own influence can be exercised. But in doing so they narrow our vision of the present, just as the cerebral mechanisms of memory shut out our vision of the past. Now, just as certain useless memories, or "dream" memories, may slip into the field of consciousness, availing themselves of a moment of inattention to life, may there not be around our normal perception a fringe of perceptions, most often unconscious, but all ready to enter into consciousness, and which do in fact enter in exceptional cases or in predisposed subjects? If there are perceptions of this kind, it is not only psychology in the strict meaning of the term that they concern; they are facts with which "psychical research" can and should concern itself.

Let us not forget, moreover, that it is space which creates the sharp divisions. Our bodies are external to one another in space; and our minds, in so far as they are attached to those bodies, are separated by intervals. But if the mind is attached to the body only by a part of itself, we may conjecture that for the other part of the mind there is a reciprocal encroachment.

Between different minds there may be continually taking place changes analogous to the phenomena of endosmosis. If such intercommunication exists, nature will have taken precautions to render it harmless, and most likely certain mechanisms are specially charged with the duty of throwing back, into the unconscious, images so introduced, for they would be very embarrassing in everyday life. Now and then, however, one of these images might pass through as contraband, especially if the inhibiting mechanisms were functioning badly; and with such a fact "psychical research" would be concerned. It may be that this is the way veridical hallucinations are produced and "phantasms of the living" arise.

The more we become accustomed to this idea of a consciousness overflowing the organism, the more natural we find it to suppose that the soul survives the body. Were, indeed, the mental moulded exactly on the cerebral, were there nothing more in a human mind than what is inscribed in a human brain, we might have to admit that consciousness must share the fate of the body and die with it. But if the facts, studied without regard to any system, lead us, on the contrary, to regard the mental life as much more vast than the cerebral life, survival becomes so probable that the burden of proof comes to lie on him who denies it rather than on him who affirms it; for the one and only reason we can have for believing in an

extinction of consciousness after death is that we see the body become disorganized; and this reason has no longer any value, if the independence of almost the totality of consciousness in regard to the body is also a fact of experience.

Such, briefly stated, are the conclusions to which an impartial examination of the known facts leads me. That is to say, I regard the field open to psychical research as very vast, and even as unlimited. This new science will soon make up the time lost. Mathematics goes back to the ancient Greeks; physics has existed now for three or four hundred years; chemistry arose in the eighteenth century; biology is nearly as old; but psychology dates from yesterday, and psychical research is almost of today. Must we regret the time lost? I have sometimes asked myself what would have happened if modern science, instead of setting out from mathematics to turn its direction towards mechancis, physics and chemistry, instead of bringing all its forces to converge on the study of matter, had begun by the consideration of mind — if Kepler, Galileo and Newton, for example, had been psychologists. They would have produced a psychology of which today we can form no idea, just as before Galileo no one could have imagined what our physics would be,— a psychology which probably would have been to our present psychology what our physics is to that of Aristotle. Foreign to every

mechanistic idea, science would have studied eagerly, instead of dismissing *a priori*, phenomena such as those you study; perhaps "psychical research" would have stood out as its principal preoccupation. The most general laws of mental activity once discovered (as, in fact, the fundamental principles of mechanics were discovered), science would have passed from pure mind to life: biology would have been constituted, but a vitalist biology, quite different from ours, which would have sought, behind the sensible forms of living beings, the inward, invisible force of which the sensible forms are the manifestations. On this force we have today taken no hold, just because our science of mind is still in its infancy; and this is why men of science are not wrong when they reproach vitalism with being a sterile doctrine: it is sterile today, it will not be so always, and it would not have been so now had modern science at its origin taken things at the other end. Together with this vitalist biology there would have arisen a medical practice which would have sought to remedy *directly* the insufficiencies of the vital force; it would have aimed at the cause and not at the effects, at the centre instead of at the periphery; healing by suggestion or, more generally, by the influence of mind on mind might have taken forms and proportions of which it is impossible for us to form the least idea. So would have been founded, so would have been developed, the science of mind-energy. But

when this science, following the manifestations of mind step by step from higher to lower, passing life and organization, had come at last to inert matter, it would then have stopped abruptly, surprised and dismayed. It would have tried to apply its accustomed methods to this new object, and it would have obtained no hold on it, just as today the processes of calculation and measurement have no hold on the things of the mind. It is matter, and not mind, which in this case would have been the realm of mystery. Suppose, then, that in an unknown land — let us say America, but an America not yet discovered by Europe and bent on having nothing to do with us — there had been developed a science identical with our actual science, with all its mechanical applications. It might then have happened that from time to time some fishermen, venturing far out from the coast of Ireland or Brittany, would have seen, far off on the horizon, an American ship moving at full speed against the wind — a steamship, let us say. They would have come and told what they had seen. Would they have been believed? Probably not. They would have been mistrusted just in proportion as those to whom they told the tale were educated and thereby imbued with a science which would have been psychical in direction, the reverse of physics and mechanics. And it would have been necessary to constitute a Society like yours — but, in this case, a Society for *physical* research — which

would have called witnesses before it, judged and criticized their tales, and established the authenticity of the "apparitions" of steamboats. However, as this Society would have been able for the moment to use only the historical or critical method, it would not have been able to overcome the scepticism of those who would have challenged it — since it believed in the existence of these miraculous boats — to construct one and make it work.

This is a dream I indulge in at times, but it is only a dream. I wake from it saying,— No, it was neither possible nor desirable that the human mind should have followed such direction. It was not possible, because mathematical science was already in existence at the dawn of the modern era, and it was therefore necessary to begin by drawing from it what it had to give for our knowledge of the world in which we live. We do not let go the prey to grasp what may be only a shadow. But, even supposing it had been possible, it was not desirable, for psychical science itself, that the human mind should have applied itself first of all to it. For though, without doubt, had there been expended on psychical science the amount of work, of talent and of genius, which has been consecrated to the sciences of matter, the knowledge of mind would have been pushed very far, yet something would have been always lacking, something of inestimable price and without which all the rest would lose

much of its value,— the precision, the exactness, the anxiety for proof, the habit of distinguishing between what is simply possible or probable and what is certain. Do not think that these are qualities natural to intelligence. Humanity did without them for a very long time; they would perhaps never have appeared in the world at all had there not existed formerly a small people, in a corner of Greece, for whom *nearly so* was not enough, and who invented precision. Mathematical proof — that creation of the Greek genius — was it here the effect or the cause? I do not know; but undoubtedly it is by mathematics that the need of proof has been passed on from intellect to intellect, taking so much the more room in the human mind as mathematical science, by means of mechanics, embraced a greater number of the phenomena of matter. The habit of bringing to the study of concrete reality the same requirements of precision, of exactness, of certitude, which are characteristic of the mathematical mind is, therefore, a habit we owe to the sciences of matter and that we should not have had without them. Therefore science, had it been applied in the first instance to the things of mind, would probably have remained uncertain and vague, however far it might have advanced; it would, perhaps, never have distinguished between what is simply plausible and what must be definitely accepted. But today that, thanks to the sciences of matter, we know how to make the distinc-

tion and possess the qualities it implies, we can adventure without fear into the scarcely explored domain of psychical realities. Let us advance therein with caution and yet with boldness, let us also cast off the bad metaphysics which cramps our movements, and the science of mind may yield results surpassing our hopes.

IV

DREAMS

A Lecture at the "Institut Psychologique," March 20, 1901.

THE subject I am to discuss is so complex, and touches so many problems,— psychological, physiological and metaphysical,— that to treat it in a complete manner would require a long development. I will therefore dispense with all preamble, set aside unessentials, and go at once to the heart of the question.

Here, then, am I, dreaming. Objects are seen to be coming and going, yet there are none of them. I seem to be walking, acting, meeting all kinds of adventures, yet I am lying all the time perfectly still in bed. I hear myself speak, and understand the answers I receive, yet all the time I am quite alone and silent. Whence comes the illusion? Why am I perceiving persons and things when nobody and nothing is there?

First, however, let us ask,— Is there nothing at all? Is there not some actual material offered to the organs of sight, touch, hearing, etc., during sleep as well as when we are awake?

Let us close our eyes and see what is going on.

Most people would say there is nothing going on. That is because they are not carefully attending. First, there is a black background. Then appear colour blotches, sometimes dull, sometimes of singular brilliancy. These spots spread and shrink, changing form and tone, constantly shifting. The change may be slow and gradual, or it may be extremely rapid. Whence comes this phantasmagoria? Physiologists and psychologists have described it as "light-dust," "ocular spectra," "phosphenes." They attribute the appearances to the slight modifications which are ceaselessly taking place in the circulation of blood in the retina, or to the pressure which the closed lid exerts upon the eyeball, causing a mechanical excitation of the optic nerve. But the explanation of the phenomena and the name we give them matter little. The appearances are common experience and they are no doubt "such stuff as dreams are made of."

Thirty or forty years ago, M. Alfred Maury and, about the same time, the Marquis of Hervey of St. Denis, observed that these colour blotches of fluid appearance may solidify at the moment of falling asleep, thus shaping the objects which are going to compose the dream. But the observation was open to suspicion, as it was the work of psychologists who were almost asleep. More recently, an American psychologist, Professor Ladd, of Yale, devised a more rigorous method, but difficult to apply, because it re-

quires a sort of training. It consists in keeping the eyes closed on awaking, and retaining for some moments the dream about to take flight — flight from the field of vision and also, probably, from that of memory. At that moment we may see the objects of the dream dissolve into phosphenes, become melted into the coloured spots which the eye really perceived when the lids were closed. We are reading, let us say, a newspaper; that is the dream. We wake up, and of the newspaper with its printed lines there is now a white spot with vague black rays; that is the reality. Or the dream is carrying us through the open sea — all around us the ocean spreads its grey waves crowned with white foam. We awake, and all is lost in a blotch of pale grey, sown with brilliant points. The blotch was there, the brilliant points were there too. There was therefore, present to our perception during our sleep, *a light-dust* and this dust served for the fabrication of the dream.

Did this alone suffice? Confining attention to the sense of sight, let us add that besides these visual sensations, the source of which is internal, there are some which have an external cause. The eyelids may be closed, but the eyes can still distinguish light from shade, and even, to a certain extent, recognize the nature of the light. The sensations evoked by the stimulus of a real light are the origin of many dreams. A candle suddenly lighted may evoke in a sleeper, if

his slumber is not too deep, a group of visions dominated by the idea of fire. Tissié recounts two instances of it: "B. dreams that the theatre of Alexandria is on *fire;* the flame lights up the whole place. All of a sudden he is transported to the fountain in the public square; a line of *fire* is running along the chains which connect the great posts placed round the basin. Now he is back in Paris at the Exhibition, which is on *fire*. He is taking part in terrible scenes, etc. He wakes up with a start. His eyes were catching the beam of light thrown by the dark lantern which the hospital nurse going her round had flashed toward his bed in passing. . . . M. dreams that he is in the navy, in which he has formerly served. He is going to Fort-de-France, to Toulon, to Lorient, to the Crimea, to Constantinople. He sees lightning, he hears thunder, now there is a battle going on in which he sees *fire* belching from the cannon. He wakes up with a start. Like B., what has wakened him is the beam of light from the dark lantern of the hospital nurse." Such are the dreams which a bright and sudden light may provoke.

Quite different are the dreams suggested by a soft and continuous light, like that of the moon. Krauss relates that one night, waking up, he was holding out his arms towards what in his dream had been a maiden, but was now the moon, the full light of which was falling on him. The case is not singular. It seems

that the rays of the moon, caressing the eyes of the sleeper, have the virtue of arousing virginal apparitions. May not this be the interpretation of the fable of Endymion, the shepherd lapped in perpetual slumber, whom the goddess Selene (that is, the moon), loves with a deep love?

The ear, too, has its internal sensations — buzzing, tinkling, whistling — which we hardly feel while awake, but may clearly distinguish in sleep. There are also some external sounds which we may continue to hear after we have fallen asleep. The creaking of furniture, the crackling of the fire, the rain beating against the window, the wind playing its chromatic scale in the chimney, such are some of the sounds which still strike the ear and which the dream may turn into conversation, cries, music, etc. Scissors are rubbed against the tongs in Alfred Maury's ears while he is asleep: at once he dreams that he hears the tocsin and is taking part in the events of June 1848. I could give many other examples. Sounds, however, do not hold so great a place in most dreams as shapes and colours. Our dreams are mainly visual. Often, indeed, we are only seeing, when we believe ourselves to be also hearing. M. Max Simon observes that sometimes it happens we are dreaming that we are engaged in a conversation, and then suddenly we become aware that no one is speaking and that no one has spoken: between our interlocutor and ourself a

direct exchange of thought was going on, a silent conversation. A strange phenomenon, yet easy to explain. To hear sounds in a dream, it is generally necessary that real sounds should be perceived. Out of nothing the dream can make nothing. And when it is not provided with sound material, a dream would find it hard to manufacture sound.

Touch also intervenes as well as hearing. A contact, a pressure, may reach consciousness even during sleep. Tactile sensations, permeating with their influence the images in the visual field, can modify their form and their meaning. Suppose, in our sleep, the contact of the body with the night-dress reaches consciousness: the sleeper will dream that he is lightly clad. Then, if his dream is at the moment taking him through the street, it is in this simple attire that he presents himself to the gaze of the passers-by — without, however, their being shocked; for it is rare that the eccentricities we exhibit in dreams seem to astonish the people whom we then see around us, although we may feel ashamed of them ourselves. I have instanced this dream because it is frequent. There is another which many of us must have experienced. It consists in feeling oneself flying, floating, moving through space without touching ground. This dream, when once it has occurred, tends to reproduce itself, and at each new experience of it we seem to be saying: "I have often dreamed that I was moving without touch-

ing the ground, but this time I am doing it while awake. I now know, and am indeed proving to other people, that we may free ourselves from the law of gravitation." If you wake up suddenly, this is what you probably find. You feel that your feet have lost contact with the ground, and this is so, for you are in fact lying extended in your bed; on the other hand, believing you are not asleep, you do not realize that you are in bed. Therefore you must be standing up, and yet you cannot be touching the ground. Such is the idea which your dream is evolving. Observe also that when you feel you are flying, you believe you are thrusting your body forward on the right side or the left by raising and flapping your arm with a sudden movement, as though you were spreading out a wing. Now, this is just the side on which you happen to be lying. Wake up and you will find that the sensation of effort for flight coincides with the real sensation given you by the pressure of your arm and of your body against the bed. Detached from its cause, it was no more than a vague sensation of fatigue, which could be ascribed to any kind of effort; attached by you, now, to the belief that your body has risen from the ground, it becomes the definite sensation of an effort to fly.

It is interesting to see how these sensations of pressure, mounting up to the visual field and taking advantage of the light-dust which fills it, can be trans-

formed into shapes and colours. Max Simon once dreamt that he had before him two heaps of gold coins: they were of unequal height, and he tried to equalize them. He did not succeed. He experienced a feeling of extreme anguish. This feeling, growing moment by moment, ended by awakening him. He then perceived that one of his legs was caught by the folds of the bedclothes, that his two feet were not on the same level and were trying in vain to get together. Hence a vague sensation of inequality, which, making an irruption into the visual field and perhaps encountering there (such, at least, is the hypothesis which I propose) one or more yellow blotches, had expressed itself visually by the inequality of two heaps of gold coins. There is, then, immanent in the tactile sensations during sleep, a tendency for them to visualize themselves and be inserted in this form in the dream.

More important still are the sensations of "internal touch," emanating from all points of the organism and, more particularly, from the viscera. Sleep may give them, or rather restore in them, a high degree of sharpness and acuity. They are there just the same, no doubt, when we are awake, but we are then turned away from them by action, living, as it were, outside ourselves. Sleep brings us back within ourselves. It happens sometimes that persons subject to laryngitis, amygdalitis, etc., feel in their dream a return of their complaint, and experience a disagreeable tingling in

the throat. Only an illusion, they say to themselves on waking. Alas! the illusion very soon becomes reality. There are cases of serious maladies and disorders, epileptic fits, heart disease, etc., which have been foreseen in this way, foretold in dream. No wonder, then, that philosophers like Schopenhauer make the dream translate to consciousness perturbations emanating from the sympathetic nervous system; that psychologists like Scherner attribute to each of our organs the power of provoking specific dreams which represent it symbolically; and that physicians like Artigues have written treatises on "the semeiological value" of the dream — that is, on the method of using dreams in the diagnosis of disease. More recently, Tissié has shown how disorders of digestion, breathing and circulation, manifest themselves in definite kinds of dream.

To sum up, then, in natural sleep our senses are by no means closed to external impressions. No doubt, they no longer have the same precision, but in compensation they are open to many "subjective" impressions which pass unperceived during waking, when we are moving in an external world common to all men, and which reappear in sleep, because we are then living only for ourselves. We cannot even say that our perception is narrowed when we are sleeping; if anything it extends, at least in certain directions, its field of operation. It is true that it loses in *tension*

what it gains in extension. It brings hardly anything but what is diffused and confused. None the less, it is out of real sensation that we fabricate the dream.

How do we fabricate it? The sensations which serve as material are vague and indefinite. Let us take those which figure on the first plane, the coloured blotches which float before us when we have closed our eyes. Here are some black lines upon a white background. They can represent a carpet, a chess-board, a printed page, or a host of other things. Who will choose? What is the form which will imprint its decision upon the indecision of the material? The form is memory.

Let us note first that the dream does not generally create anything. Doubtless there may be cited some examples of artistic, literary and scientific work executed in the course of a dream. I recall the one which is the best known of all. Tartini, a musician of the eighteenth century, was toiling at a composition, but the muse was rebellious. He fell asleep. The devil then appeared in person, seized the violin and played the sonata. Tartini wrote it from memory when he awoke. It is now known to us as "The Devil's Sonata." But we can deduce no conclusion from so summary an anecdote. We should want to make sure that Tartini did not bring the sonata to a definite shape while he was trying to remember it. The imagination of the dreamer who awakes adds

sometimes to the dream, modifies it retrospectively and fills in the lacunae, which may be many. I have tried to find more detailed observation and unquestionable authenticity. I can cite no better case than that of Robert Louis Stevenson. In a curious essay entitled "A Chapter on Dreams," he informs us that many of his stories, and these the most original, were composed, or at least sketched, in dream. But read the chapter carefully, and you will see that during part of his life he lived in a psychical condition in which it was very hard to know whether he was asleep or awake. I believe, indeed, that when mind is creating, when it is giving the effort which the composition of a work of art or the solution of a problem requires, it is not actually asleep. I mean that the part of the mind which is working is not the same as that which is dreaming: the working part is pursuing its task in the subconscious; this task is without influence on the dream and only manifested at the awaking. As to the dream itself, it is little else than a resurrection of the past. But it is a past we sometimes fail to recognize. Often it has to do with a forgotten circumstance, with a remembrance which had apparently disappeared, which in reality lay concealed in the depths of memory. Often, too, the image evoked is that of an object or fact which we have perceived distractedly, almost unconsciously, while awake. Or it may be made up of fragments of broken memories, picked up here and there, presented to the

consciousness of the dreamer in an incoherent form. To this heterogeneous assemblage of meaningless fragments the intellect (which, contrary to what has been said, continues to reason) seeks to give a meaning. It attributes the incoherence to lacunae which it endeavours to fill by evoking other memories, and these, being often presented in the same disorder, call for a new explanation in their turn, and so on indefinitely. But I do not insist upon this point for the moment. It is sufficient for me to say, in order to answer the question I have propounded, that the power which gives form to the materials furnished to the dream by the different senses, the power which converts into precise, definite objects the vague impressions received by the eyes, the ears and the whole surface and interior of the body, is memory.

Memory! In the waking state we have indeed memories which appear and disappear, occupying our mind in turn. But they are memories which are closely connected with our situation and our action. I recall at this moment the book of the Marquis of Hervey on dreams. That is because I am discussing the problem of the dream, and because I am lecturing to the Psychological Institute. My surroundings and my occupation, what I perceive and what I have to do, are giving a particular orientation to the activity of my memory. The memories that we evoke while in our waking state, however remote they may often appear

from our preoccupations of the moment, are always attached to some aspect of them. What is the role of memory in the animal? It is to recall to it, in each circumstance, the advantageous or injurious consequences which have followed under analogous conditions, and so teach it what it ought to do. In man, I admit, memory is less the slave of action, yet it adheres closely to it. Our memories, at a given moment, form one solidary whole, a pyramid whose point coincides with our present,— with a present moving ceaselessly and plunging into the future. But, behind the memories which crowd in upon our present occupation and are revealed by means of it, there are others, thousands on thousands of others, below and beneath the scene illuminated by consciousness. Yes, I believe our past life is there, preserved even to the minutest details; nothing is forgotten; all we have perceived, thought, willed, from the first awakening of our consciousness, persists indefinitely. But the memories which are preserved in these obscure depths are for us in the state of invisible phantoms. They aspire, perhaps, to the light: they do not even try to rise to it; they know it is impossible, and that I, a living and acting being, have something else to do than occupy myself with them. But suppose that, at a given moment, I become *disinterested* in the present situation, in the pressing action, in both of the forces which concentrate on one single point all the activities of mem-

ory; suppose, in other words, I fall asleep: then these repressed memories, feeling that I have set aside the obstacle, raised the trap-door which held them back below the floor of consciousness, begin to stir. They rise and spread abroad and perform in the night of the unconscious a wild phantasmagoric dance. They rush together to the door which has been left ajar. They all want to get through. But they cannot; there are too many of them. Of the many called, which will be chosen? It is easy to guess. Just now, when awake, the memories admitted were those which could claim relationship with my present situation, with my actual perceptions. Now, more fleeting are the forms which stand out before my eyes, more indecisive the sounds which affect my ears, more indistinct the touch impressions distributed over the surface of my body;— but more numerous, now, are the sensations coming to me from within my organs. So, then, among the phantom memories which aspire to weight themselves with colour, with sound, in short with materiality, those only succeed which can assimilate the colour-dust I perceive, the noises without and within that I hear, etc., and which, besides, are in harmony with the general affective state which my organic impressions compose. When this union between memory and sensation is effected, I dream.

In a poetic page of the *Enneades,* Plotinus explains to us how men are born to life. Nature, he says,

sketches living bodies, but only sketches them. Left to her own forces alone, she could not complete the picture. On the other hand, souls dwell in the world of the Ideas. Incapable of acting, and moreover not even thinking of acting, they lie at rest above time and outside space. But, among bodies, there are some which by their form respond more than others to the aspirations of certain souls. And, among souls, there are some which find their own likeness, so to say, in certain bodies. The body, unfinished, as it has been left by nature, rises towards the soul which can give it complete life. And the soul, looking down on the body and perceiving it as the reflexion of itself in a mirror, is fascinated, leans forward and falls. This fall is the beginning of life. I may liken these detached souls to the memories lying in wait in the depth of the unconscious, and the bodies to our sensations during sleep. Sensation is warm, coloured, vibrant and almost living, but vague; memory is clear and distinct, but without substance and lifeless. Sensation longs for a form into which to solidify its fluidity; memory longs for matter to fill it, to ballast it, in short, to realize it. They are drawn towards each other; and the phantom memory, materializing itself in sensation which brings it flesh and blood, becomes a being which lives a life of its own, a dream.

The birth of the dream, then, is no mystery. Indeed, a dream is elaborated almost in the same way as

a perception of the real world. The mechanism of the operation is the same in its main lines. For what we see of an object placed before our eyes, what we hear of a sentence pronounced in our ear, is trifling in comparison to what our memory adds to it. When we read a book or glance through the newspaper, do we actually perceive each letter of each word or even each word of each sentence? Were it so, we should not read many pages. The fact is that we only actually see, in a word and in a sentence, a few letters, or even a few characteristic strokes, just what is needed in order that we can guess all the remainder: as for that remainder, we fancy we are seeing it, but we are actually producing in ourselves the hallucination of it. There are numerous and decisive experiments which leave no doubt on this point. I will cite only those of Goldscheider and Müller. The experiments consisted in writing or printing ordinary notices such as "No admission," "Preface to the fourth edition," etc., and purposely making mistakes, changing and above all omitting letters. The notices were posted, one at a time, in the dark before the subject of the experiment, who, of course, was ignorant of what had been written. Then light was flashed on the notice for a very short time, too short for the observer actually to see all the letters. They began by finding experimentally the minimum time required to perceive a single letter of the alphabet: it was then easy to adapt the illumination

so that the observer should not have time to distinguish more than eight or ten letters of the thirty or forty in the notice. Now he usually read the notice without difficulty. But this is not the most instructive point in the experiment. If the observer was asked what letters he was *sure* of having seen, he would sometimes name, of course, some of the letters really present, but he would just as well name letters that were absent,—whether simply omitted or replaced by others. So, because the meaning appeared to require it, he had seen standing out in full light non-existent letters. The characters actually perceived had therefore served to evoke a remembrance. The unconscious memory, discovering the notice to which they gave a start towards realization, had projected that remembrance outward in the form of hallucination. It is this remembrance which the observer had *seen,* as much and more than the actual inscription. In short, rapid reading is a work of divination, but not of abstract divination: it is an externalization of memories, of perceptions simply remembered and consequently unreal, which profit by the partial realization that they find here and there in order to be realized integrally.

Thus, in the waking state, the knowledge we seize of an object implies an analogous operation to that which is accomplished in dream. We perceive only of the thing a mere sketch; this flashes an appeal to the

memory of the complete thing; and the complete memory, of which our mind is unconscious, or in any case is only conscious of as a thought, profits by the occasion to spring out. It is this kind of hallucination, inserted and fitted into a real frame, which we provide for ourselves when we perceive things. There are, besides, many interesting observations which concern the conduct and attitude of the memory-images during this operation. Images, however deep and far back in our memory, are not inert and indifferent. They are active and ready; they are almost attentive. If, for example, with my mind pre-occupied, I open the newspaper, I may at once drop on some word which exactly responds to my preoccupation. But lo! the sentence has no meaning, and I soon discover that the word read is not the word printed; it had simply some features in common with it, a vague resemblance of form. The idea which was absorbing me must therefore have aroused in the unconscious all the images of the same family, all the recollections of corresponding words, and given them hope, so to say, of a return to consciousness. One only has effectively come to consciousness, namely, that which the actual perception of a certain form of word had already begun to realize.

Such is the mechanism of true perception, and such is that of the dream. In both cases there are, on the one hand, real impressions made on the organs of

sense, and on the other, memories which encase themselves in the impression and profit by its vitality to return to life.

What, then, is the difference between perceiving and dreaming? What is sleep? I am not concerned, of course, with its physiological conditions. This is the business of physiologists; it is far from being settled. I am inquiring how we are to represent the sleeping person's state of soul. For the mind continues to function during sleep; it exercises itself, as we have just seen, on sensations and memories; and in the sleeping as in the waking state it combines the sensation with the memory which the sensation evokes. Yet we have, on the one hand, normal perception, and on the other, dream. The mechanism, therefore, does not work in the same way in each. What is the difference? What are the psychological characteristics of the sleeping state?

We must distrust theories. Some tell us that sleep consists in being isolated from the external world. But we have seen that sleep does not close our senses to external impressions, and that these impressions provide the materials of most of our dreams. Others, again, tell us tht in sleep the higher functions of thought are reposing, that there is a suspension of reasoning. I do not think this is any more exact. In the dream we often become *indifferent* to logic, but not *incapable* of logic. I will even venture to say, at

the risk of seeming paradoxical, that what is wrong with the dreamer is rather that he reasons too much. He would avoid absurdity, were he content to be a simple spectator at the procession of his dream images. But when he ventures to give an explanation, his logic, required to bind together incoherent images, can only parody reason and verge on the absurd. I acknowledge, however, that the higher intellectual faculties are relaxed during sleep, and that, even if the reasoning faculty is not encouraged that way by the incoherent play of the images, it may sometimes indulge in counterfeiting normal reasoning. But one might say as much of all the other faculties. It is, then, not by the abolition of reasoning, any more than by the closing of the senses, that we must characterize dreaming. Let us leave theory and come to fact.

A decisive experiment must be made by introspection. On coming out of a dream,— since we cannot analyse the dream while we are dreaming,— we must watch the transition from sleeping to waking, follow upon it as closely as possible: attentive to what is essentially inattention, we shall spy out, from the point of view of one who is already awake, the yet present state of one who sleeps. It is difficult, but not impossible to any one who has been patiently preparing for it. Let me then recount one of my dreams and what I believe I perceived on awaking.

I dream that I am on a platform, addressing an as-

sembly. A confused murmur arises at the back of the auditorium. It increases. It becomes a muttering, a roar, a frightful tumult. At length there resounds from all parts, bursting out in regular rhythm, the cry, — Out! Out! At this moment I become suddenly awake. A dog is barking in a neighbouring garden, and with each Wow! Wow! of the dog the cry Out! Out! seems to be identical. This is the moment to seize. The waking self, which has suddenly reappeared, turning to the dream-self, which is still there, pounces upon it and says: "Caught in the very act! You show me a shouting crowd and there is only a barking dog. Do not think you can escape. I shall not let go until you reveal your secret, and let me see exactly what it is you were doing!" To which the dream-self replies: "Simply use your eyes. Look! *I was doing nothing,* and there is no other difference between you and me. You imagine that to hear a dog barking, and to know that it is a dog that barks, you have nothing to do? Profound mistake! You are making, without suspecting it, a big effort. You are taking your whole memory, all your accumulated experience, and by a sudden compression bringing it to converge on the sound you hear at the one single point of the memory which most resembles the sensation and can best interpret it. The sensation is then exactly covered by the memory. You must obtain perfect

coincidence, there must not be the slightest overlapping of sensation or memory (if there be, you have precisely the condition of dream). This adjustment you can only secure by an attention or rather by a simultaneous tension of sensation and memory, fitting the one to the other as the tailor fits on and tightens a new garment. Your life in the waking state is, then, a life of toil, even when you suppose you are doing nothing, for at every moment you must choose and at every moment you have to exclude. You choose among your sensations, since you reject from consciousness a host of "subjective" sensations which reappear when you sleep. You choose among your memories, since you reject every recollection which does not mould itself on your present state. This choice which you are continually accomplishing, this adaptation ceaselessly renewed, is the essential condition of what you call common sense. But such adaptation and choice keeps you in a state of uninterrupted tension. You take no account of it at the time, any more than you feel the weight of the atmosphere. But it fatigues you in the long run. Common sense is very fatiguing.

"Now, let me repeat it, I differ from you preciesly in that I do nothing. The effort you are called on to make without cessation, I simply abstain from. You are attached to life, I am detached from it.

Everything is indifferent to me. I am disinterested in everything.[1] To sleep is to be disinterested. We sleep to the exact extent to which we are disinterested. A mother asleep by the side of her child will not hear the thunder, but the child's sob will wake her. Is she, then, really asleep in regard to her child? We do not sleep in regard to anything which continues to interest us.

"You ask me what I do when I dream? Let me tell you what you do when you wake. I, your dream-self, am the totality of your past — you take me and bring me, from contraction to contraction, to shut myself into the very small circle you trace around your present action. This is being awake, this is living the normal psychical life, and this is striving and willing. As to dreaming, need I explain it? It is the state into which you naturally fall when you let yourself go, when you no longer care to concentrate yourself on a single point, when you cease to will. If you still insist and require explanation, ask how your will contrives, at every moment of waking life, to obtain instantaneously and almost unconsciously the concentration of all that you have within you on the

[1] The idea put forward here has made way since it was first proposed in the lecture. The concept of sleep-disinterestedness has found a place in psychology. The word "désintérêt" is now used to denote the general state of the sleeper's consciousness. M. Claparède has founded a very interesting theory on the concept. He regards sleep as a means of defence for the organism, a kind of instinct.

one point which interests you. But address your inquiry to the psychology of waking. Its main function is to reply to you, for *waking* and *willing* are one and the same."

This is what the dream-self would say. It might tell us much more would we let it. But I must conclude. What is then the essential difference between being in a dream and being awake? I will sum it up by saying that the same faculties are being exercised whether we are awake or dreaming, but they are in tension in the one case, and relaxed in the other. The dream is the entire mental life, minus the effort of concentration. We still perceive, still remember, still reason. Perceptions, memories, reasonings may abound in a dreamer, for abundance, in the mental domain, does not mean effort. What requires effort is the *precision of adjustment*. For the barking of a dog, while it is going on, to detach from my memory the recollection of an uproarious assembly simply because that recollection happens to be on its way, I need not do anything. But that the barking should go and choose, in preference to all recollections, the recollection of a bark, and thereupon, coalescing with it, be interpreted,— I mean, actually perceived as a bark,— requires a positive effort. The dreamer has no longer the force to make it. This, and this alone, distinguishes him from the man who is awake.

Such is the difference. It is expressed in many

forms. I will not enter into detail, but will limit myself to drawing your attention to three points, viz., the instability of the dream, the rapidity with which it can pass, and the preference it shows for insignificant recollections.

The instability is easily explained. The essence of the dream being not to adjust the sensation with precision to the memory but to allow some play between them, very different memories will suit equally well the same dream sensation. Suppose, for example, there is in the field of vision a green blotch strewn with white points. It is able to materialize the recollection of a daisied lawn, a billiard-table with its balls, and any number of other things besides. All these will therefore be striving to live again in the sensation, all will be in the chase. Sometimes they reach it one after another; the lawn *becomes* a billiard-table, and we are present at extraordinary transformations. Sometimes they reach it all together; then the lawn *is* a billiard-table,— an absurdity which the dreamer will try to get rid of by a reasoning which will only aggravate it.

The rapidity with which some dreams unroll themselves appears to me to be another effect of the same cause. In a few seconds a dream can present to us a series of events which would occupy, in the waking state, entire days. The classical instance given by Alfred Maury is well known: "I am in

bed in my room, my mother at my pillow. I am dreaming of the Terror; I am present at scenes of massacre, I appear before the Revolution Tribunal, I see Robespierre, Marat, Fouquier-Tinville . . . ; I defend myself; I am convicted, condemned to death, driven in the tumbril to the Place de la Révolution; I ascend the scaffold; the executioner lays me on the fatal plank, tilts it forward, the knife falls; I feel my head separate from my body, I wake in a state of intense anguish, and I feel on my neck the curtain pole which has suddenly got detached and fallen on my cervical vertibrae, just like a guillotine knife. It had all taken place in an instant, as my mother bore witness; and yet it was that external sensation which I had taken for the departure point of a dream in which so many facts succeeded one after another" (Maury, *Le Sommeil et les Rêves,* fourth edition, p. 161). Whatever view be held by one or two psychologists of the literal accuracy of the fact, I regard it as probable, for I find analogous descriptions in the literature of dreams. But this precipitation of images is not mysterious. Dream images are especially visual. The conversations that the dreamer supposes he has heard are for the most part reconstituted, completed, amplified at waking; perhaps even in some cases it is no more than the thought of the conversation, its meaning as a whole, which accompanies the images. Now a multitude, however vast,

of visual images may be given all at once in panorama; how much the more so may it be in a succession of moments, however few! It is not astonishing, then, that the dream should gather into a few seconds what in waking life is extended over several days. It sees them foreshortened. It proceeds exactly as memory does. In the waking state, the visual memory which serves to interpret the visual sensation must fit it exactly; it follows the sensation as it unrolls, both of them occupy the same time. That is to say, the recognized perception of external events lasts just as long as the events themselves. But, in dream, the interpretative memory of the visual sensation regains its freedom; the fluidity of the visual sensation prevents the memory adhering to it; the rhythm of the interpretative memory has no longer, therefore, to adopt that of reality; and the images may then, if they please, rush along with a dizzy rapidity, like a cinematograph film when the speed of the unwinding is not held in check. Precipitation is no more a sign of force in the domain of mind than abundance is. It is the regulating,— the constant precision of the adjustment,— which requires effort. Bring the interpretative memory to a state of tension, let it pay attention to life, let it, in short, get out of its dream: immediately the outside events will beat the measure for its walking and slacken its pace,— exactly as in a clock the pendulum portions and distributes over

several days the detension of the spring which would run down almost instantly if left free.

Turning to the third point, I am now called upon to explain why the dream prefers such and such a recollection to others that are equally capable of covering over the present sensation. But, unfortunately, the whims of the dream are hardly more explicable than those of the waking state. All that I can do is to point out their main tendency. In normal sleep, it is the thoughts which have passed like flashes through the mind, or the objects which we have perceived without paying attention to them, which dreams are most likely to bring back. If, at night, we dream of the events of the day, it is insignificant incidents, not important facts, which will have the best chance of reappearing. I agree entirely on this point with the views of Delage, W. Robert and Freud.[2] I am in the street, I am waiting for a tramcar to pass, it cannot touch me because I am on the pavement. If, at the moment of its sweeping past, the idea of a possible danger crosses my mind, nay, even if my body instinctively recoils without my being conscious of feeling any fear, I may dream at night that I am run over. I am watching by day at the sick-bed of a friend who is dying.

[2] I refer here to those repressed tendencies to which the Freudian school have devoted a great amount of research. At the time when this lecture was delivered, Freud's *Traumdeutung* had appeared, but "psychoanalysis" had not reached anything like its present development.

Only a ray of hope springs up for an instant,— a faint ray, I am barely conscious of it,— my dream at night may show me my friend recovered. In any case I should dream he was cured rather than dead or ill. What reappears by preference is what had been least noticed. There is nothing astonishing in this. The dream-self is a distraught self, a self which has let itself go. The memories which harmonize best with it are the memories of distraction, those which bear no mark of effort.

Such are the observations I intended to offer you on the subject of dreams. They are, I know, incomplete. Yet they concern dreams only as we know them today, those we remember and which belong therefore rather to slight sleep. When we are in deep sleep, we may have dreams of another kind, but little or nothing remains of them when we wake. I incline to think,— though for theoretical and therefore hypothetical reasons,— that we have then a much more extensive and detailed vision of our past. This deep slumber is that on which psychology ought to direct its effort, not only to study the structure and functioning of unconscious memory, but also to investigate the more mysterious phenomena which are the subject-matter of "psychical research." I have not myself adventured on this ground; my inexperience does not prevent me, however, attaching great importance to the observations collected with such indefatigable

zeal by the Society for Psychical Research. To explore the unconscious, to labour in the subsoil of mind with specially appropriate methods, will be the principal task of psychology in the century which is opening. I do not doubt that great discoveries await it,—discoveries as important, perhaps, as the preceding centuries have witnessed in the physical and natural sciences. Such at least is the hope I entertain for it, and with this parting wish I conclude.

V

MEMORY OF THE PRESENT AND FALSE RECOGNITION

An Article in the "Revue Philosophique," December, 1908.

THE illusion concerning which I am going to submit a few explanatory views is well known. Some one may be attending to what is going on or taking part in a conversation, when suddenly the conviction will come over him that he has already seen what he is now seeing, heard what he is now hearing, uttered the sentence he is uttering,— that he has already been here in this very place in which he now is, in the same circumstances, feeling, perceiving, thinking and willing the same things, and, in fact, that he is living again, down to the minutest details, some moments of his past life. The illusion is sometimes so complete that, at every moment whilst it lasts, he thinks he is on the point of predicting what is going to happen: how should he not know it already, since he feels that he is about to have known it? It is by no means rare for the person under this illusion to perceive the external world under a peculiar aspect, as in a dream; he becomes a stranger to himself, ready to be his double,

present as a simple spectator at what he is saying and doing. This "depersonalization," to employ a term used to describe the experience by M. Dugas,[1] is not identical with or necessarily a symptom of false recognition; it has, however, a certain relationship to it. Moreover, all the symptoms differ in degree. The illusion, instead of being a complete picture, may often present itself as a mere sketch. But, sketch or finished picture, it always bears its original character.

There are on record many descriptions of false recognition. They resemble one another in a striking manner, and are often set forth in identical terms. I have in my possession the self-observation of a literary man, which he specially undertook for me. He was skilled in introspection, had never heard of the illusion of false recognition, and believed himself to be the only person to experience it. His description consists of some dozen sentences, all of which are met with, in almost identical words, in the published records of other cases. I congratulated myself at first that I had at least obtained a new expression of it, for the author tells me that what dominates the phenomenon is a feeling of "inevitability," a feeling that no power on earth could stop the words and acts, about to come, from coming. But re-reading the cases recorded by M. Bernard-Leroy,[2] I find in one of them an identical

[1] "Un Cas de dépersonnalisation," *Rev. philos.* (1898), pp. 500–507.
[2] *L'Illusion de fausse reconnaissance* (Paris, 1898), p. 176.

expression: "I was a spectator of my own actions; they were inevitable." Indeed, it is doubtful if there exist another illusion stereotyped with such precision.

I do not include under false recognition certain illusions which resemble it on one side or another, but differ from it in their general aspect. M. Arnaud described in 1896 a remarkable case which he had then had under observation for three years. Throughout this time the patient had experienced, or *believed he experienced,* continuously the illusion of false recognition, imagining himself living his whole life over again.[3] This case, moreover, is not an isolated one; it seems to approach very nearly a very early case described by Pick,[4] a case described by Kräpelin[5] and also one related by Forel.[6] Reading these cases we are at once aware of something quite different from false recognition. The illusion does not spring up as a sharp and short impression, which surprises by its strangeness. The subject finds, on the contrary, that what he experiences is natural and normal; he sometimes has need of that impression; he seeks it when it fails him, and believes it to be even more continuous than it is in reality. Studying the illusion more closely,

[3] *Annales médico-psychologiques* (1896), pp. 455–470.
[4] *Arch. f. Psychiatrie* (1876), pp. 568–574.
[5] *Ibid.* (1887), p. 428.
[6] *Das Gedächtnis und seine Abnormitäten* (Zürich, 1885), pp. 44–45.

we discover other well-marked differences. In false recognition, the illusory memory is never localized in a particular point of the past; it dwells in an indeterminate past,— the past in general. In these cases, on the contrary, the patients refer to a particular date the experience they claim already to have had; they are the prey of a real hallucination of memory. They are, it should be observed, all cases of insanity. That of Pick and those of Forel and Arnaud suffer delirious ideas of persecution; that of Kräpelin is a maniac with hallucinations of vision and hearing. Their mental trouble may have some relation to that described by Coriat under the name of "reduplicative paramnesia," [7] what Pick himself in a more recent work calls "a new form of paramnesia." [8] In this last case the subject believed he had already several times lived his actual life. Arnaud's patient had exactly the same illusion.

A more delicate question is raised by the studies of M. Pierre Janet on psychasthenia. In opposition to most authorities, M. Janet considers false recognition a purely pathological state, relatively rare, at any rate vague and indistinct, and he holds that it would be unjustifiable on the facts to describe it as a specific

[7] *Journal of Nervous and Mental Diseases* (1904), pp. 577–578, 639–659.

[8] *Jahrbücher für Psychiatrie und Neurologie* (1901), pp. 1–35.

illusion of memory.[9] It is in reality concerned, in his view, with a much more general trouble. The "function of the real" is enfeebled, the patient has not completely succeeded in apprehending the actual; he cannot say with certainty whether now is present, past or even future; he will decide for the past if that idea be suggested in the questions put to him. That psychasthenia, which has been so thoroughly studied by M. Pierre Janet, is the dumping-ground of a host of anomalies, and that false recognition is one of them, I do not contest. Nor do I wish to dispute the psychasthenic character of false recognition in all cases. The question is, however, whether the phenomenon, when it is found precise, complete and sharply analysable into perception and memory, when, moreover, it is produced in people who present no other anomaly, has the same internal structure as when it appears with a vague form — rather a tendency or disposition than a definite clean-cut state — in minds which manifest a whole group of psychasthenic symptoms. Suppose that false recognition, considered simply as we know it, a disorder always temporary and never severe, be a means contrived by nature in order to localize at one spot and limit to a few instants and so reduce to its mildest form a certain insufficiency which, were it to spread and, so to

[9] *Les Obsessions et la psychasthénie* (1903), vol. i. p. 287 ff.; cf. *Journal de psychologie* (1905), pp. 139–166.

speak, be diluted in the whole psychical life, *would be* psychasthenia: we should then expect that this concentration at one spot would give to the resulting state of mind a precision, a complexity and above all an individuality not found generally among patients suffering from general psychasthenia and thereby apt to shape into a vague form of false recognition, as well as into a great many other mental peculiarities, the radical deficiency from which they suffer. The illusion would in such case be a distinct psychical entity, whilst it is not so with general psychasthenic patients. Nothing we are told concerning this illusion in psychasthenic patients need be rejected. But what we have to explain is why and how there is created the particular feeling of " already seen " in those cases — numerous, I believe — in which there is the very distinct affirmation of a present perception *and* of a past perception which has been identical with it. It must be borne in mind that many of those who have studied false recognition — Jensen, Kräpelin, Bonatelli, Sander, Anjel and others — were themselves subject to it. They have not limited themselves to collecting cases; as professional psychologists, they have noted what they have themselves experienced. Now all these authorities agree in describing the phenomenon as being clearly a recommencement of the past, a *twofold* phenomenon, which is perception on one side, memory on another, and not a phenomenon of single aspect, a

state in which the reality appears simply in the air, detached from time, perception *or* memory at will. So, without sacrificing anything of what M. Pierre Janet has taught us on the subject of psychasthenia, we have none the less to find a special explanation of the phenomenon distinguished as false recognition.[10]

What is the explanation? In the first place, there is the view of those who hold that false recognition arises from the identification of an actual perception with a former perception really resembling it in its content, or at least in its affective tone. According to some of these authorities (Sander,[11] Höffding,[12] Le Lorrain,[13] Bourdon,[14] Bélugou [15]) the past perception belongs to waking experience; according to others (James Sully,[16] Lapie,[17] etc.) to dream experience; according to Grasset,[18] to waking or to dreaming but always to the *unconscious*. According to all, whether they mean the memory of something seen or the mem-

[10] We may note that most authorities regard false recognition as a very wide-spread illusion. Wigan thought every one subject to it. Kräpelin calls it a normal phenomenon. Jensen declares that almost any one, attentive to himself, may experience the illusion.

[11] *Arch. f. Psychiatrie* (1874), pp. 244–253.

[12] *Psychologie,* pp. 166–167.

[13] *Rev. Philos.* (1894), pp. 208–210.

[14] *Rev. Philos.* (1893), pp. 629–631.

[15] *Rev. Philos.* (1907), pp. 282–284.

[16] *Illusions,* p. 198.

[17] *Rev. Philos.* (1894), pp. 351–352.

[18] *Journ. de psychologie* (1904), pp. 17–27.

ory of something imagined, false recognition is a confused or incomplete recall of a real memory.

This explanation may be accepted within the limits set by several of those who propose it.[19] It applies, in fact, to a phenomenon which resembles false recognition in certain aspects. It has happened to all of us, in the presence of some new scene, to wonder whether we had not seen it before, and on reflexion we have found that we had formerly had an analogous perception which presented several features in common with the present experience. But this phenomenon is very different. In false recognition the two experiences appear strictly identical, and we feel indeed that no reflexion would reduce the identity to a vague resemblance, because we are not simply beholding the "already seen"; it is much more than that; we are living through again the "already lived." We believe we have to do with the complete reinstatement of one or of several minutes of our past with the totality of their content, presentative, affective, active. Kräpelin, who has insisted on this primary difference, notices still another.[20] The illusion of false recognition comes over a person suddenly and as suddenly vanishes, leaving behind it an impression of dream.

[19] Ribot and William James, who both thought out an explanation of this kind, were careful to add that they proposed it only as applicable to certain special cases: Ribot, *Les Maladies de la mémoire,* p. 150; James, *Principles of Psychology,* vol. i. p. 675.

[20] *Archiv. f. Psychiatrie* (1887), pp. 409–436.

We find nothing of the kind in the confusion of a present experience with a former resembling experience — a confusion which is more or less gradual in establishing itself, and more or less easy to dissipate. Let me add (and this is perhaps essential) that such confusion is an error like other errors, a phenomenon localized in the domain of the pure intellect. On the contrary, false recognition may disturb our whole personality; it concerns feeling and will as well as intellect. Whoever experiences it is often the prey of a characteristic emotion, becoming more or less a stranger to himself and, as it were, "automatized." In this case, therefore, we have an illusion which includes different elements and which organizes them into one single simple effect, a real psychic individuality.[21]

Where must we look for its seat? Is it to be found in an idea, in an emotion or in a state of will?

The tendency to regard it as centred in an idea is characteristic of theories which explain false recognition by bringing in an image supposed to have arisen in the course of perception or a little before it, and to have been at once thrown back into the past. To account for this image, it was first supposed that the brain was double, that it produced two simultaneous perceptions, one of which might in certain cases be

[21] The hypothesis of M. Grasset, according to which the first experience had been registered by the unconscious, would, strictly speaking, avoid the last two objections, but not the first.

lagging by reason of its feebler intensity, and produce the effect of a memory (Wigan,[22] Jensen[23]). Fouillée[24] also speaks of a "lack of synergy and simultaneity in the cerebral centres," whence is produced a double vision (*diplopie*), "a pathological phenomenon of echo and internal repetition." Contemporary psychology is seeking to get away from these anatomical schemes, and the hypothesis of a cerebral duality is now completely abandoned. There remains, then, the theory that the second image may be some part of the perception itself. According to Anjel, we must in fact distinguish two aspects in all perception: the one is the crude impression made on the consciousness, the other the taking possession of that impression by the mind. Ordinarily the two processes coincide, but if one lag behind the other, a double image results, and this occasions false recognition.[25] Piéron has put forward an analogous idea.[26] Lalande,[27] followed by Arnaud,[28] holds that a scene may produce on us an instantaneous first impression of which we are scarcely conscious, and to this there may succeed a distraction of some seconds, after which the normal perception is established. Should at this moment the first impres-

[22] *A New View of Insanity: the Duality of the Mind* (1884), p. 85.
[23] *Allgemeine Zeitschift für Psychiatrie, Suppl.* (1868), pp. 48–63.
[24] *Rev. des Deux Mondes* (1885), p. 154.
[25] *Arch. f. Psychiatrie* (1878), pp. 57–64.
[26] *Rev. Philos.* (1902), pp. 160–163.
[27] *Rev. Philos.* (1893), pp. 485–497.
[28] *Annales médico-psychol.* (1896), p. 455.

sion come back to us, it would have the effect of a vague memory not localizable in time, and we should then have false recognition. F. W. H. Myers proposed an explanation no less ingenious, founded on the distinction between the conscious and the subliminal ego. The conscious ego receives only a total impression of a scene at which it is present, the details of it being always a little later than those of the external stimulus; the subliminal ego photographs these details one after the other, instantaneously. The latter is therefore in advance of consciousness, and, if suddenly manifested to it, brings a memory of that which the conscious ego is then occupied in perceiving.[29] Lemaître [30] has adopted a position intermediate between those of Lalande and Myers. Before Myers, Dugas had put forward the hypothesis that there is a splitting of the personality.[31] Also, before either of these, Ribot had given great force to the theory of two images by his suggestion that there is in these cases a kind of hallucination intenser than perception and following it: the hallucination throws the perception into the background, so giving it the dim form of a mere remembrance.[32]

It is impossible for me to undertake the full

[29] *Proc. Soc. for Psychical Research* (1895), p. 343.
[30] *Arch. de Psychologie* (1903), pp. 101–110.
[31] *Rev. Philos.* (1894), pp. 34–35.
[32] *Les Maladies de la mémoire*, p. 152.

examination each of these theories deserves. I am content to say that I accept them in principle. I hold that false recognition implies the very real existence in consciousness of two images, one of which is the reproduction of the other. The great difficulty, in my view, is to explain, first, why one of the two images is thrown back into the past, and, second, why the illusion is continuous. If we take the image thrown back into the past to be anterior to the image localized in the present, if we see in it a first perception less intense, less attended to or less in consciousness than the later perception, we must at least attempt to explain why it takes the form of a memory; but, even then, we have to do only with the memory of a certain moment of the perception; the illusion will not be prolonged and renewed throughout the duration of the perception. If, on the contrary, the two images are formed together, then the continuity of the illusion is easier to understand, but the rejection of one of them into the past calls even more imperatively for explanation. We may indeed ask whether any one of the hypotheses, even of the first kind, really accounts for the throwing back, and whether the feebleness or subconsciousness of a perception suffices to give it the aspect of a memory. In any case, a theory of false recognition must answer at the same time both requirements, and in my view the two requirements must ap-

pear irreconcilable so long as the nature of normal memory is not studied from the purely psychological standpoint.

Can we escape the difficulty by denying the duality of the images, by invoking an "intellectual feeling" of the "already seen" and supposing it sometimes superadded to our perception of the present, making us believe in a recommencement of the past? This is the idea that has been put forward by M. Bernard-Leroy in an important work.[33] I am quite ready to agree with him that recognition of the present is generally without any calling up of the past. I have myself shown that the "familiarity" of the objects of daily experience must be ascribed to the automatism of the reactions they provoke, and not to the presence of a memory-image doubling the perception-image. But this feeling of "familiarity" is surely not what intervenes in false recognition, and Mr. Bernard-Leroy has himself been at pains to distinguish the one from the other. The feeling of which M. Bernard-Leroy speaks can only be, then, the same as we experience when we say to ourselves, in passing a person in the street, that we must already have met him. But then such feeling is doubtless inseparably

[33] *L'Illusion de fausse reconnaissance,* 1898. The reading of this book, which describes many new cases, is indispensable to the student of the subject. Mlle. J. Tobolowska, in her *Étude sur les illusions du temps des rêves* (1900), adopts M. Bernard-Leroy's conclusions.

bound to a real memory, the memory of that person or of some one else who resembles him: it may be only the vague, almost extinct consciousness of this recollection, together with the nascent and unsuccessful effort to revive it. Then, too, it is significant that in such a case we say, " I have seen that person somewhere "; we do not say ," I have seen that person here, in these very circumstances, at a moment of my life indistinguishable from this actually present moment." If, then, false recognition has its root in a feeling, it is a feeling unique of its kind and it cannot be the feeling of normal recognition wandering over consciousness and deceived as to its destination. Being special, it must depend on special causes, and it behooves us to discover them.

Let us, then, turn to the third group, theories according to which the origin of the phenomenon is to be sought in the sphere of action, rather than in that of feeling or in that of thought. Such is the most recent tendency. Many years ago, I myself called attention to the need of distinguishing various heights of *tension* or *tone* in psychical life. Consciousness, I said, is better balanced the tenser its concentration on action, and more unstable the more it is detended in a kind of dream. Between these two extreme planes — the plane of action and the plane of dream — there are, I added, as many corresponding intermediate planes as there are decreasing degrees of " at-

tention to life " and adaptation to reality. (See *Matter and Memory,* pp. 220–232.) My suggestions were received with a certain reserve, appearing to some people paradoxical. Psychology, however, is now coming nearer and nearer to them, especially since M. Pierre Janet from quite different considerations has reached conclusions altogether in agreement with them. It is in the lowering of such mental tone that, according to the third group of theories, we are to look for the origin of false recognition. In M. Pierre Janet's view, this lowering produces the phenomenon directly by diminishing the effort of synthesis accompanying normal perception, which then takes the aspect of a vague memory or a dream.[34] More precisely, M. Janet thinks that we have to do here with one of the " feelings of incompletedness " which he has studied in so original a manner. The patient, puzzled at finding that his perception is incompletely real, and therefore incompletely present, hardly knows if he is dealing with the present or the past or even with the future. M. Léon-Kindberg has thought out and developed this idea of a diminution of the effort of synthesis.[35] On the other hand, Heymans has tried to show how a " lowering of psychical energy " might modify the aspect of our habitual environment

[34] *Les Obsessions et la psychasthémie* (1903), vol. i. p. 287; also *Journal de psychologie* (1905), pp. 289–307.

[35] *Rev. de Psychiatrie* (1903), pp. 139–166.

and communicate the aspect of "already seen" to events which are happening in it. "Suppose," he says, "that our usual surrounding should arouse only very feebly the associations regularly awakened by it. There would then occur precisely what happens when after many years we see again places or objects, hear again melodies, formerly known but long since forgotten. . . . Now, if in such cases of normal recollection we have learnt to interpret the feebler push of associations as a sign of former experiences relating to the same objects as those now present, we may conjecture that in the other cases too, where, following a diminution of psychical energy, the usual surrounding displays a very diminished associative power, we shall have the impression that in it are being repeated, identically, personal events and situations drawn from the depth of a nebulous past." [36] Lastly, in an elaborate paper written by Dromard and Albès, and in which we find, drawn up as a self-observation, one of the most acute analyses ever given of false recognition,[37] the phenomenon is explained as a diminution of "attentional tone" which brings about a rupture between the "lower psychism" and the "higher psychism." The lower psychism, functioning without the aid of the higher, perceives the present object automatically, and the higher psychism is then entirely

[36] *Zeitschrift für Psychologie* (1904), pp. 321–343.
[37] *Journal de Psychologie* (1905), pp. 216–228.

occupied in contemplating the image formed by the lower instead of regarding the object itself.[38]

I may say of these theories, as of the former, that I accept the principle underlying them. It is in a lowering of the general tone of the psychical life that the originating cause of false recognition is to be looked for. The delicate point is to determine the peculiar form which inattention to life takes in this case, and also we must explain why its effect is to mistake the present for a repetition of the past. A mere slackening of the effort of synthesis may indeed give to reality the aspect of a dream — but why should such dream appear to be the complete repition of a moment already lived? Even supposing that the "higher psychism" intervenes in order to superpose its attention on this inattentive perception, all that we should have would be a memory attentively considered, and by no means a perception duplicated with a memory. On the other hand, mere idleness of associative memory, such as Heymans supposes, would simply render difficult the recognition of the surroundings: it is a long way from the difficult recognition of something familiar to the memory of a definite past identical in every point with the present. It seems, then, that we must combine the two systems of explanation,

[38] In the same way, "dépersonalisation" has been explained as a "lowering of vital tone." Cf. Dugas, "Un cas de dépersonalisation," *Rev. Philos.*, 1898, pp. 500–507.

admit that false recognition is at once a diminution of psychical tension and a duplication of the image, and inquire what must be the diminution which will produce duplication, what the duplication which will simply express diminution. But it would be a mistake to devise any artificial scheme for reconciling the two theories. Let us simply study the mechanism of memory in the two directions indicated, and the two theories will be seen to join together.

However, a remark must first be made concerning all psychical facts that are morbid or abnormal. Among them are some which evidently point to an impoverishment of the normal life. Such are the anaesthesias, the amnesias, the aphasias, the paralyses, all those states, in fact, which are characterized by the loss of particular sensations, particular memories, or particular movements. In order to define these states we simply have to indicate what has disappeared from consciousness. They consist in an absence. We all agree in seeing in them a psychic deficiency.

On the contrary, there are morbid or abnormal states which appear to add something to normal life and enrich it instead of impoverishing it. A delirium, a hallucination, an obsession, are positive facts. They consist in the presence, not in the absence, of something. They seem to introduce into the mind certain new ways of feeling and thinking. To define them,

we have to consider what they are and what they bring, instead of what they are not and what they take away. If most of the symptoms of insanity belong to this second category, so also do a great many psychical anomalies and singularities. False recognition is one. As we shall see later, it presents an aspect *sui generis,* far different from that of true recognition.

However, the philosopher may very well question whether, in the mental domain, disorder and degeneration can really be capable of creating something, and whether the apparently positive characters which give the abnormal phenomenon an aspect of novelty are not, when we come to study their nature, reducible to an internal void, a shortcoming of normality. Disease, we generally say, is a diminution. True; but this is a vague way of expressing it, and we should indicate precisely, when no actual part of consciousness is missing, wherein the consciousness is diminished. I made an attempt of this kind in a former work to which I have already referred. I pointed out that, besides the diminution which affects the *number* of the states of consciousness, there is another which concerns their solidity or their *weight.* In the first case, the disorder simply and only eliminates some states without affecting others. In the second, no psychical state disappears but all are affected, all lose something of their ballast, that is to say, of their power of insertion and penetration into the reality. (See *Matter and Mem-*

ory, Chapter III., especially pp. 227–230.) It is the "attention to life" which is diminished, and the new phenomena which are started are only the visible aspect, the outward appearance of this detachment.

I recognize, however, that even under this form the idea is still too general to be applied to the explanation of particular psychical facts. But it points the direction we must follow to find an explanation.

For, if we accept this principle, we shall not, in the case of a morbid or abnormal phenomenon presenting special characters, have to seek any active cause, because the phenomenon, despite appearances, has nothing positive and nothing new about it. It was already being manufactured while the conditions were normal; but it was prevented from emerging, when about to appear, by one of those continually active inhibitory mechanisms which secure *attention to life.* This means that normal psychical life, as I conceive it, is a system of functions, each with its own psychic organ. Were each of these organs to work by itself, there would result a host of useless or untoward effects, liable to disturb the functioning of the others and so upset that adjustable equilibrium by which our adaptation to the environment is continually maintained. But a work of elimination, of correction, of bringing back to the point, is constantly going on, and it is precisely this work which secures a healthy mind. Wherever this work is slackened, symptoms seem to be created,

fresh and new, but in reality they were always there, or rather would have been there if nothing had interfered. I quite understand that the investigator should be struck with the *sui generis* character of the morbid facts. As they are complex and yet present a certain order in their complication, his first inclination is to relate them to an acting cause, capable of organizing the elements of them. But if, in the mental domain, disease is unable to create, it can only consist in the slackening or stopping of certain mechanisms which in the normal state prevent others from having their full effect. If this be so, then, in this case *the principal task of psychology is not to explain why certain phenomena are produced in disordered minds, but why they are not found in the normally healthy mind.*

Already I have applied that method to the study of dreams. We are too much inclined to look upon dreams as if they were phantoms superadded to the solid perceptions and conceptions of our waking life, will-o-the-wisps which hover above it. They are supposed to be facts of a special order, to which psychology ought simply to devote a special chapter and then be quit of them. And it is natural they should appear so, because the waking state is what matters to us, whilst the dreaming state is most foreign to action and most useless. From the practical point of view dream is merely an accessory, so from the theoretical point of view we come to regard it as an

accident. But let us set aside this preconceived idea, and the dream-state will then be seen, on the contrary, to be the substratum of our normal state. The dream is not something fantastic hovering above and additional to the reality of being awake; on the contrary, that reality of the waking state is gained by limitation, by concentration and by tension of a diffuse psychical life, which is the dream-life. In a sense, the perception and memory we exercise in the dream-state are more natural than those in the waking state: there does consciousness disport itself, perceiving just to perceive, remembering just to remember, with no care for life, that is, for the action to be accomplished. But the waking state consists in eliminating, in choosing, in concentrating unceasingly the totality of the diffuse dream-life at the point where a practical problem is presented. To be awake means to will. Cease to will, detach yourself from life, disinterest yourself, and by that mere abstention you pass from the awake-self to the dream-self — less *tense* but more *extended.* The mechanism of the awake-state is, then, the more complex, more delicate and more *positive* of the two, and it is the awake-state, rather than the dream-state, which requires explanation.

Now, if dreams are in every respect an imitation or counterfeit of insanity, we may expect our remarks on dreams to apply as well to many forms of insanity. Of course, we must avoid approaching the study of

mental diseases with anything like a stereotyped system. It is doubtful if all the phenomena of insanity are to be explained on one and the same principle. And for many of them, still undefined, it is hardly possible yet to attempt an explanation. As I said at first, I offer my view simply as a methodological indication, with no other object than that of pointing a direction for theoretical inquiry. There are, however, some pathological or abnormal facts to which I believe it is even now applicable. One of the chief of these is false recognition. For the mechanism of perception and the mechanism of memory seem to me such that false recognition would arise naturally from the joint play of the two faculties, were there not a special mechanism intervening at the same time in order to prevent it. The important thing to know, then, is not why it arises in certain persons at particular moments, but why it is not being produced at every moment in everybody.

How is a recollection formed? Let it first be clear, however, that the recollections of which I am going to speak are always psychical, although they may be more often unconscious than conscious or semi-conscious. Concerning recollections considered as traces left in the brain, I have given my view in *Matter and Memory,* the work to which I have had frequent occasion to refer. I have attempted there to prove that

the various memories are indeed localized in the brain, in the meaning that the brain possesses for each category of memory-images a special contrivance whose purpose is to convert the pure memory into a nascent perception or image; but if we go further than this, and suppose every recollection to be localized in the matter of the brain, we are simply translating undoubted psychical facts into very questionable anatomical language, and we end in consequences which are contradicted by observation. Indeed, when we speak of our recollections, we think of something our consciousness possesses or can always recover by drawing in, so to say, the thread which holds it. The recollection, in fact, passes to and fro from consciousness to unconsciousness, and the transition from one to the other is so continuous, the limit between the two states so little marked, that we have no right to suppose a radical difference of nature between them. It is memory in this purely psychical meaning of which I am going to speak. On the other hand, let us agree to call "perception" the consciousness of anything that is present, whether it be an internal or an external object. Both definitions being granted, I hold that *the formation of memory is never posterior to the formation of perception; it is contemporaneous with it.* Step by step, as perception is created, the memory of it is projected beside it, as the shadow falls beside the body. But, in the normal condition, there is no con-

sciousness of it, just as we should be unconscious of our shadow were our eyes to throw light on it each time they turn in that direction.

For suppose memory is not created at the same moment as the perception: at what moment will it begin to exist? Does it wait till the perception is vanished that it may then arise? This is what we usually suppose, whether we think unconscious recollections are psychical states or cerebral modifications. In the one case we suppose a present psychical state, the perception, then, when that no longer exists, the remembrance of that absent perception. In the other case, we think that when certain cells come into play there is perception, and that the action of those cells has left traces so that, when the perception has vanished, there is memory. But, if things happen in this way, the course of our conscious existence must be composed of clear-cut states, each of which must begin objectively, and also objectively end. Now, is it not clear that dividing psychical life into states, as we divide a play into scenes, is relative to the varied and changing interpretations we give of our past and has nothing absolute about it? According to the point of view in which I am placed, or the centre of interest which I choose, I divide yesterday differently, discovering several very different series of situations or states in it. Though these divisions are not all equally artificial, not one existed in itself, because the unrolling

of psychical life is continuous. The afternoon I happen to have spent in the country with friends has broken up into luncheon + walk + dinner, or into conversation + conversation + conversation, etc., and of none of these conversations, treading as it were on the heels of another, could it be said that it forms a distinct entity. Scores of systems of carving are possible; no system corresponds with joints of reality. What right have we, then, to suppose that memory chooses one particular system, or that it divides psychical life into definite periods and awaits the end of each period in order to rule up its accounts with perception?

Is it alleged that the perception of an external object begins when the object appears, and ends when it disappears, and that therefore we can, in this case at least, mark the precise moment when memory replaces perception? But this is to ignore the fact that the perception is ordinarily composed of successive parts, and that these parts have just as much individuality, or rather just as little, as the whole. Of each of them we can as well say that its object is disappearing all along: how, then, could the recollection arise only when everything is over? And how could memory know, at any particular moment of the operation, that everything was not over yet, that perception was still incomplete?

The more we reflect, the more impossible it is to imagine any way in which the recollection can arise

if it is not created step by step with the perception itself. Either the present leaves no trace in memory, or it is twofold at every moment, its very up-rush being in two jets exactly symmetrical, one of which falls back towards the past whilst the other springs forward towards the future. But the forward-springing one, which we call perception, is that alone which interests us. We have no need of the memory of things whilst we hold the things themselves. Practical consciousness throwing this memory aside as useless, theoretical reflexion holds it to be non-existent. Thus the illusion arises that memory *succeeds* perception. But this illusion has another source deeper still.

The main cause is that the reanimated and conscious memory produces on us the effect of the perception itself, and appears to be the resurrection of the perception, feebler but not substantially different. Between the perception and the memory there seems to be a difference of intensity or degree, but not of nature. The perception being defined a strong state and the remembrance a weak state, the remembrance of a perception being necessarily then nothing else than that same perception weakened, it seems to us that memory, in order to register a perception in the unconscious, must wait until the whole of it goes to sleep. And so we suppose the remembrance of a perception cannot be created while the perception is

being created nor be developed at the same time.

But the theory that present perception is a strong state, and revived recollection a feeble state, that perception passes into recollection by way of diminution, is contradicted by the most elementary observation of fact. Take an intense sensation and make it gradually decrease to zero. If there is only a difference of degree between the remembrance of the sensation and the sensation itself, the sensation will become memory before it disappears. Now, a moment may come when you are unable to say whether you are dealing with a weak sensation experienced or a weak sensation imagined, but the weak state never becomes the recollection, thrown back into the past, of the strong state. The recollection, then, is a totally different thing.

The recollection of a sensation is capable of *suggesting* the sensation, I mean of causing it to be born again, feeble at first, then stronger and stronger in proportion as the attention is more fixed upon it. But the recollection is distinct from the sensation it suggests; and it is precisely because we feel it behind the sensation it suggests, as the hypnotizer is behind the hallucination he provokes, that we localize its cause in the past. Sensation is essentially what is actual and now; but the recollection which suggests it from the depths of the unconscious, hardly emerging upwards, has that power *sui generis* of suggestion which belongs to things that are no more and would fain exist

again. Hardly has the suggestion touched the imagination than the thing suggested is outlined in its nascent state, and this is why it is so difficult to distinguish between a weak sensation experienced and a weak sensation which we remember without dating it. But the suggestion is in no degree what it suggests. The pure recollection of a sensation or of a perception is not a degree of the sensation or the perception itself. To suppose it so would be like saying that the word of the hypnotizer, in order to suggest to the hypnotized patient that he has in his mouth sugar or salt, must already itself be a little sugared or salted.

If we try to discover the source and purpose of this illusion, we find that innate in our mind is the need to represent our whole inner life as modelled on that very small part of ourself which is inserted into the present reality, the part which perceives it and acts upon it. Our perceptions and our sensations are at once what is clearest in us and most important for us; they note at each moment the changing relation of our body to other bodies; they determine or direct our conduct. Thence our tendency to see in the other psychical facts nothing but perceptions or sensations obscured or diminished. Those, indeed, among us who resist this tendency, who believe thought to be something other than a play of images, yet have some trouble in persuading themselves that the remem-

brance of a perception is radically different from the perception itself. The remembrance must at any rate, it seems to them, be expressible in terms of perception. It must then be obtained by some operation effected on the image. What is the operation? Here a process of natural reasoning intervenes. We can say *a priori* that the operation must effect an alteration in the *quality* of the content of the image, or in its *quantity,* or in both at once. Now, it is certainly not in the quality, since memory must represent the past to us without altering it. It must be then in the quantity. But quantity, in its turn, may be extensive or intensive, for the image comprehends a definite number of parts and it presents a certain degree of force. Does, then, memory modify the extension of the image? Evidently not, for if it added anything to the past, it would be unfaithful to it, and if it subtracted something from the past, it would be incomplete. We conclude, then, that the modification bears on the intensity; and as it is evidently not an increase, it must be a diminution. Such is the instinctive, scarcely conscious dialectic by which we are led, from elimination to elimination, to see in the remembrance an enfeeblement of the image.

When once we have reached this conclusion, our whole psychology of memory is inspired by it; even our physiology feels the effect of it. In whatever way we then conceive the cerebral mechanism of per-

ception, we see in recollection nothing but the same mechanism set going anew, an attenuated repetition of the same fact. Facts stand before us, however, and seem to point to the opposite direction. They evidence that a man can lose visual recollections without ceasing to see and auditory recollections without ceasing to hear, that psychic blindness and deafness do not necessarily imply loss of sight or of hearing: how would this be possible if perception and memory were concerned with the same centres, and put in play the same mechanisms? But we turn aside or pass on, rather than assent to a radical distinction between perception and memory.

In so far, then, as our reason reconstructs psychical life out of conscious states sharply delineated, and in so far as it judges that all those states are expressible in terms of images, it is following two paths which converge in making memory an enfeebled perception, something which follows the perception instead of being contemporaneous with it. Set aside this natural dialectic of the intellect, convenient though it be for expression in language, possibly indispensable in practice, but not suggested by inward observation, and observe what actually takes place. The memory will be seen to duplicate the perception at every moment, to arise with it, to be developed at the same time, and to survive it precisely because it is of a quite different nature.

What, then, is a memory? Every clear description of a psychical state is made up of images, and we are saying that the recollection of an image is not an image. The pure recollection, then, can only be described in a vague manner and in metaphoric terms. Let me repeat, then, an explanation I suggested in *Matter and Memory* (pp. 167 and 172 and also the first chapter). The memory seems to be to the perception what the image reflected in the mirror is to the object in front of it. The object can be touched as well as seen; acts on us as well as we on it; is pregnant with possible actions; it is *actual.* The image is *virtual,* and though it resembles the object, it is incapable of doing what the object does. Our actual existence, then, whilst it is unrolled in time, duplicates itself all along with a virtual existence, a mirror-image. Every moment of our life presents two aspects, it is actual and virtual, perception on the one side and memory on the other. Each moment of life is split up as and when it is posited. Or rather, it consists in this very splitting, for the present moment, always going forward, fleeting limit between the immediate past which is now no more and the immediate future which is not yet, would be a mere abstraction were it not the moving mirror which continually reflects perception as a memory.

Let us imagine a mind to become conscious of this duplicating. Suppose the reflexion of our perception

and of our action comes to consciousness not when the perception is complete and the action accomplished, but continuously and simultaneously, step by step, as we perceive and act. We must then see, at one and the same time, our real existence and its virtual image, the object on one side and its reflexion on the other. Moreover, the reflexion can not be confused with the object, for the object has all the characters of perception whilst the reflexion is already memory: were it not memory from the first, it never could become so. Later on, when performing its normal function, it will represent our past to us with the mark of the past; discerned at the very moment in which it is formed, it is already with the mark of the past, which is constitutive of its essence, that it appears to us. What past? A past that has no date and can have none; it is the past *in general,* it cannot be any past in particular. No doubt, if it were merely a past scene or a past emotion, we might be actually deceived and believe that we have already perceived the scene we are actually perceiving, that we have already experienced the motion we are experiencing. But it is far more than this. What is duplicating itself at each moment into perception and memory is the totality of what we are seeing, hearing and experiencing, all that we are with all that surrounds us. As we are becoming conscious of this duplication, it is the entirety of our present which must appear to us at once as perception and as mem-

ory. And yet we know full well that no life goes twice through the same moment of its history, that time does not remount its course. What is to be done? The case is most extraordinary and bewildering. It contradicts everything that we have been accustomed to. We feel that we are confronted with a recollection: a recollection it must be, for it bears the characteristic mark of states we usually call by this name and which only appear when their object has disappeared. And yet it does not present to us something which has been, but simply something which is; it advances *pari passu* with the perception which it reproduces. It is a recollection of the present moment in that actual moment itself. It is of the past in its form and of the present in its matter. It is a *memory of the present.*

Step by step, as the situation progresses, the memory which keeps pace with it gives to each of its stages the aspect of "already seen," the feeling of already known. But the situation, even before it has come to an end, seems to us something which must form a whole, being cut out of the continuity of our experience by the interest of the moment. Now, how could we have already lived a part of the situation if we had not lived the whole of it? Could we recognize what is being unrolled if we did not know what is still rolled up? Are we not able at each moment to anticipate at least the following moment? The instant

which is about to come is already broken into by the instant which now is; the content of the one is inseparable from the content of the other: therefore, if the present instant belongs already to my past, must not the coming instant belong to it equally? If I recognize the present instant, am I not quite as surely going to recognize the coming one? So I am unceasingly, towards what is on the point of happening, in the attitude of a person who will recognize and who consequently knows. But this is only the *attitude* of knowledge, the form of it without the matter. As I cannot predict what is going to happen, I quite realize that I do not know it; but I foresee that I am going to have known it, in the sense that I shall recognize it when I shall perceive it; and this recognition to come, which I feel inevitable on account of the rush of my faculty of recognizing, exercises in advance a retroactive effect on my present, placing me in the strange position of a person who feels he knows what he knows he does not know.

Suppose we catch ourselves repeating mechanically something we once knew by heart but had long forgotten. As we recognize each word the moment we pronounce it, we have a feeling that we possess it before pronouncing it; and yet we only get it back while we pronounce it. Whoever becomes conscious of the continual duplicating of his present into perception and memory will be in the same state. If even slightly

capable of self-analysis, he will compare himself to an actor playing his part automatically, listening to himself and beholding himself play. The more deeply he analyses his experience, the more he will split into two personages, one of which moves about on the stage while the other sits and looks. On the one hand, he knows that he continues to be what he was, a self who thinks and acts conformably to what the situation requires, a self inserted into real life and adapting itself to it by a free effort of will; this is what his preception of the present assures him. But the memory of this present, which is equally there, makes him believe that he is repeating what has been said already, seeing again what has been seen already, and so transforms him into an actor reciting his part. Thence two different selves, one of which, conscious of its liberty, erects itself into an independent spectator of a scene which the other seems to be playing in a mechanical way. But this duplication does not go through to the end. It is rather an oscillation between two standpoints from which one views oneself, a going and coming of the mind between perception which is only perception and perception duplicated with memory. The first implies the habitual feeling we have of our freedom and quite naturally inserts itself into the real world. The second makes us believe we are repeating a part we have learned, converts us into automata, transports us into a stage-world or

a world of dream. Whoever has experienced during a few seconds a pressing danger, from which he has only been able to escape by a rapid series of actions imperatively called for and boldly executed, knows something of the kind. It is a duplication rather virtual than actual. We act and yet "are acted." We feel that we choose and will, but that we are choosing what is imposed on us and willing the inevitable. Thence a compenetration of states which melt into one another and even coincide in immediate consciousness, but which are none the less logically incompatible. Because they are logically incompatible, reflective consciousness will represent them by a duplication of the self into two different personages, one of which appropriates freedom, the other necessity: the one, a free spectator, beholds the other automatically playing his part.

To sum up: I have imagined a mind, in its normal state, to become conscious of the duplication which is constantly but unconsciously going on, and I have described, in the last three pages, the three principal aspects under which that mind would appear to itself if it could thus witness the splitting of its present. Now, these are the very characteristics of false recognition. We find them the more accentuated the more definite the phenomenon is, the more complete it is, and the more profoundly analysed it is by the person who experiences it.

Several of those who have experienced it have spoken, to begin with, of a feeling of automatism, and of a state comparable to that of an actor playing a part. What is said and what is done, what the person himself says and does, appear "inevitable." He is looking on at his own movements, thoughts and actions.[39] Things happen *as though* his personality were duplicated, without, however, there being actual duplication. One of them writes: "This feeling of duplication only exists in the sensation; the two persons are only one from the material standpoint." He means probably that he experiences a feeling of duality, but accompanied with the consciousness that there is only one person.[40]

On the other hand, as I said at the beginning of this essay, the subject of this experience often finds himself in the singular state of mind of a person who believes he knows what is about to happen at the same time that he feels quite unable to predict it. "It seems always to me," says one, "that I am foreseeing what is going to happen, yet I cannot actually announce it." Another recalls what is going to happen "as one recalls a name which is at the uttermost ends of memory." [41] One of the earliest observations is that

[39] See especially the cases collected by Bernard-Leroy, *op. cit*, pp. 176, 182, 185, 232.

[40] Bernard-Leroy, *op. cit.* p. 186.

[41] Lalande, *Rev. Philos.* (1893), p. 487.

of one who believed he knew beforehand what the people around him would do.[42] We have in this a second characteristic of false recognition.

But the most general characteristic of all is the one to which I first called attention. The memory evoked is a loose memory, with no point of attachment in the past. It does not correspond with any former experience. The subject knows it, is convinced of it, and the conviction is not the effect of reasoning, it is immediate. It is a feeling that the recollection evoked must be simply a duplicate of the actual perception. Is it, then, a "memory of the present"? If he does not use these words, it is probably because the expression would appear to him contradictory, because he only conceives memory as a repetition of the past, because it does not seem possible that a representation can bear the mark of the past independently of what it represents. In fact, he theorizes without knowing it, and holds all memory to have been formed after the perception which it reproduces. Yet he affirms something very like it when he speaks of a past which no interval separates from the present. "I felt within me a kind of click which did away with all the past lying between that minute of long ago and the minute in which I then was."[43] These words give expression to the most distinctive mark of the pheno-

[42] Jensen, *op. cit.* p. 57.
[43] F. Gregh, quoted by Bernard-Leroy, p. 183.

menon. When we speak of it as " false recognition," we ought to add that it is a process which does not really counterfeit true recognition and which does not give the illusion of it. What, in fact, is normal recognition? It may be produced in two ways, either by a feeling of familiarity which accompanies the present perception, or by the evoking of a past perception which the present perception seems to repeat. Now false recognition is neither of these two operations. What characterizes the first kind of recognition is that it excludes any recall of a definite personal situation in which the recognized object had formerly been perceived. My desk, my table, my books form around me an atmosphere of familiarity only so long as they do not call up the recollection of any definite event of my history. If they evoke the exact recollection of an incident in which they have been mixed up, I recognize them as having been a part of that incident, but this recognition is superadded to the first and is fundamentally distinct from it, as distinct as the personal from the impersonal. Now false recognition is something quite different from this feeling of familiarity. It always bears on a personal situation, which we are convinced is the identical reproduction of another personal situation, just as precise and as definite. It would seem, then, that it must be recognition of the second kind, one which implies the recall of a former situation like the

present one. But then it should be noticed that we have always to do in such cases with situations similar and not identical. Recognition of the second kind is brought about by the idea of what differentiates the two situations and not only of what is common to them. If I am at a play which I have seen before, I recognize one by one each of the words and each of the scenes; at last I recognize the whole piece and recall having seen it before; but I had then a different seat, and other neighbours, and was taken up with other preoccupations; in any case I could not have been then what I am today, since I have lived in the meanwhile. If, then, the two images are the same, they are not presented in the same frame, and the vague feeling of the difference of the frames surrounds, like a fringe, the consciousness I have of the identity of the images, and allows me at every moment to distinguish them. In false recognition, on the contrary, the frames are just as identical as the images themselves. I am present at the same play with the same sensations, the same preoccupations, I am at this very moment in the very same position, at the same date, at the same instant of my history where and when I then was. It is, then, hardly fit to speak here of illusion, since the illusory knowledge is the imitation of a real knowledge, and since the phenomenon with which we are dealing imitates no other phenomenon of our experience. And it is

hardly fit to speak of false recognition, since there is no true recognition, of the one kind or of the other, of which it could be the exact counterfeit. We are in fact dealing with a phenomenon unique of its kind, the very phenomenon which the memory of the present would produce, were it to rise up instantaneously from the unconscious where it must lie. It would appear as memory, since memory bears a distinctive mark, different from that of perception; but it could not be carried back to any past experience, because each of us knows indeed that we do not live twice through one and the same moment of our history.

I turn now to the problem why this memory is ordinarily concealed, and how it is revealed in extraordinary cases. In a general way, or *by right,* the past only reappears to consciousness in the measure in which it can aid us to understand the present and to foresee the future. It is the forerunner of action. We go wrong when we study the functions of thought in their isolated state as if they were an end in themselves, and we pure minds occupied in contemplating ideas and images. The present perception would in that case attract to itself a resembling memory with no suspicion of utility, without purpose, for mere pleasure — the pleasure of introducing into the mental world a law of attraction analogous to that which governs the material world. Without questioning the "law

of similarity," I may point out that any two ideas and any two images taken at random, however distant from one another we may suppose them to be, must have some relation of similarity since we can always find a common genus into which to make them enter: so that any perception would recall any recollection if there were nothing more, here, than a mechanical attraction of like for like. But the fact is that if a perception recalls a memory, it is in order that the circumstances which have preceded, accompanied and followed the past situation, should throw some light on the present situation and indicate the way out of it. Thousands and thousands of memories evoked by resemblance are possible, but the memory which tends to reappear is the one which resembles the perception by a particular side, that namely which may illumine and direct the action in preparation. Even this memory need not show itself; it is enough if, without showing itself, it recall the circumstances which have been given in contiguity with it, what has preceded and what has followed, what in short it is important to know in order to understand the present and anticipate the future. We may even suppose that the contiguous circumstances need not be manifested to consciousness, so long as the conclusion can appear, that is to say, the exact suggestion of a certain thing to do. It is in this mode, probably, that consciousness works in most animals. But the more the

consciousness is developed, the more it illumines the work of the memory, and the more, too, it lets association by resemblance, which is the means, shine through association by contiguity, which is the end. When once the association has had official recognition in consciousness, it allows the introduction of a crowd of fancy memories, which resemble the present state but may be devoid of actual interest. In this way we may explain why we can dream as well as act; but it is the needs of action which determine the laws of recall; they alone hold the keys of consciousness, and fancy memories only slip in by taking advantage of what is lax and ill-defined in the relation of resemblance which legally entitles to a pass. In short, if the totality of our recollections be at every moment pushing upward from the depth of the unconscious, consciousness, attentive to life, only admits, legally, those which can offer their assistance to the present action, although, in fact, many others slip in because there must be a general rule, and because the rule, here, is that resemblance secures admittance.

But what can be more unavailing for our present action than memory of the present? Rather would any other kind of memory be entitled to lay a claim, for it at least brings with it some information, though it be of no actual interest. Alone, memory of the present has nothing to teach us, being only the double of perception. We have the real object, what are

we to do with the virtual image of it? As well let go the substance for the shadow. This is why there is no memory from which our attention is more obstinately turned away.

By attention, of course, I do not mean here that individual attention which varies in its intensity, direction and duration according to personal temperament. I am alluding to what I should call racial attention, an attention naturally turned towards certain regions of psychical life, naturally turned away from others. Within each of these regions our individual attention may be directed, no doubt by its own caprice, but it then simply supervenes on that racial attention, as the choice that the individual eye makes of particular visual objects is superposed on the choice which the human eye has made once for all, of a certain definite region of the spectrum in which it sees light. Now, while a slight failure of individual attention is only absent-mindedness,— a normal thing,— any failure of racial attention takes the form of a pathological or abnormal fact.

False recognition is such an anomaly. It indicates a temporary enfeebling of general attention to life: consciousness, no longer turning in its natural direction, allows itself to look at what it has no interest in perceiving. But what are we to understand here by "attention to life"? What is the particular kind of inattention which ends in false recognition? At-

tention and inattention are vague terms. Can we define them more exactly in this particular case? Let me try to do so, without claiming, however, to attain in so obscure a subject complete clearness and definite precision.

We hardly notice the extent to which our present consists in an anticipation of our future. The vision reflective consciousness gives us of our inner life is that of one state succeeding another state, each commencing at one point, finishing at another, and provisionally self-sufficing. Consciousness, in this reflective vision, is preparing the way for language; it is distinguishing, separating and juxtaposing; it is only at its ease in the definite and the immobile; it stops at a static conception of reality. But immediate consciousness grasps quite another thing. Immanent in the inward life, it feels rather than sees it, but feels it as a movement, as a continual treading on a future which recoils without ceasing. Indeed, this feeling becomes very clear when it concerns a definite act we are called on to perform. The end of the action appears to us immediately; and, during the whole time that we are acting, we are conscious not so much of the successive states as of a decreasing distance between our actual position and the end towards which we are approaching. This end, moreover, is perceived only as a provisional end; we know there is something else behind; in the spring we take to leap the first obstacle

we are already preparing to leap a second, until other leaps will take place and succeed one another indefinitely. Again, when we listen to a sentence, we need not pay attention to each word taken separately, it is the meaning of the whole which matters: from the very beginning we are reconstructing this meaning hypothetically; our mind darts forward in a certain general direction, only having to inflect it here and there according as the sentence, unrolling, pushes our attention towards one meaning or another. Here again the present is perceived in the future on which it treads, rather than apprehended in itself. This vital impulse gives to all the psychical states it causes us to pass or leap over a particular aspect, which is so constant and to which we are so accustomed that we only become aware of it when it is missing. Every one may have observed the strange character a familiar word sometimes takes when we fix our attention on it. The word appears new, and really is so, for till then our consciousness had not made it a stopping place; we had always passed it by to come to the end of a sentence. We cannot compress the impulse of our whole psychical life as completely as we compress that of our speech; but whenever the general impulse is enfeebled, the situation passed through must appear as strange as the sound of a word immobilized in the course of the movement of the sentence. It is no longer part and parcel of real life. Looking in our past experi-

ence for what resembles it most, we are likely to compare it with dream.

Now, it is remarkable that most of the recorded cases of false recognition just describe the experience as an impression of dream. Paul Bourget, for example, observes that the illusion is accompanied by "a kind of unanalysable feeling that reality is a dream." [44] And an English writer some years ago, describing his own experience, applied the epithet "shadowy" to the whole phenomenon, adding that it appeared later, when it was recollected, as "the half-forgotten relic of a dream." Thus we have observers, unknown to one another, speaking different languages, expressing themselves in actually equivalent terms. The impression of dream, then, is almost general.

It is also remarkable that persons subject to false recognition are often liable to finding a familiar word strange. An inquiry instituted by G. Heymans has shown that these two dispositions are connected together. He adds very justly that current theories of the first phenomenon do not explain why it is associated with the second.

In these conditions, ought we not to look for the initial cause of false recognition in a momentary stop of the impulse of our consciousness, a stop which, no doubt, does not change anything in the materiality of our present, but detaches it from the future to

[44] Bernard Leroy, *op. cit.* p. 169.

which it cleaves and from the action which would be its normal conclusion, so giving it the aspect of a mere picture, of a play which is being presented to the player, of a reality transposed into dream? Let me now describe an impression derived from my own personal experience. I am not subject to false recognition, but I have tried very often, since I have studied it, to place myself in the state of mind described by observers and to induce experimentally the phenomenon in myself. I have never quite succeeded, but I have obtained on various occasions something approaching it, although very fugitive. The scene in which I find myself must be not only new to me, but in strong contrast with the course of my habitual life. It may be, for example, a scene when I am on a journey, but this journey must have been improvised, not premeditated. The first condition is, then, that I should experience a certain quite peculiar astonishment, which I will call *the astonishment at finding myself there*. On this astonishment there comes to be grafted a feeling rather different from it, but yet in relationship with it, the feeling that *the future is closed*, that the situation is detached from everything although I am attached to it. In the degree that these emotions interpenetrate, the reality loses its solidity and my perception of the present tends to duplicate itself with something which is behind it. Is

this the *memory of the present* appearing through? I do not venture to say so; but it seems to me that I am then verily on the road to false recognition, and that a very little would bring me to it.

Now, why does *memory of the present* wait, before it can be revealed, for the *impulse of consciousness* to slacken or to stop? We know nothing of the mechanism by which an idea comes out of the unconscious or falls back into it. All we can do is to have recourse to a provisional scheme by which we can symbolize the operation. Let us come back to the one which we have already used. Let us imagine the totality of unconscious recollections pressing against consciousness,— consciousness laying down the general rule that only what can serve action is allowed to pass. The memory of the present is striving like the rest; moreover, it is nearer to us than any other memory. Hanging on to our perception of the present, it is always on the point of entering into it. Perception only escapes from it by a continual movement forward to keep itself in front. In other words, a memory can only be actualized by means of a perception: the memory of the present would therefore penetrate into consciousness, could it insinuate itself into the perception of the present. But this is always in advance of it: thanks to the impulse which animates it, perception is less in the present than in the future. Suppose now

the impulse suddenly to stop: memory rejoins perception, the present is cognized and recognized at the same time.

False recognition seems then to be, upon the whole, the most harmless form of inattention to life. A constant lowering of tone of the fundamental attention is expressed outwardly by actual disorder or disease, more or less enduring, more or less severe. But it may happen that this attention is maintained ordinarily at its normal tone, and that its insufficiency is manifested in a quite different manner, namely by temporary arrests of functioning, generally very short, separated and far apart. As soon as the arrest occurs, false recognition overtakes consciousness, covers it for some instants and then falls back, like a wave.

Let me conclude with a final hypothesis, at which I hinted in the beginning of this essay. If inattention to life can take two forms unequally severe, should we not be right in supposing that the more benign form is nature's means of preserving the individual from the more severe form? In cases when fundamental attention is insufficient and when, therefore, there is a perpetual risk of passing completely from the state of waking to the state of dream, consciousness localizes the evil at a few points where attention stops for a short time and resigns entirely: attention is thus made able, all the rest of the time, to remain steadily fixed on reality. Certain distinct cases of false recognition

appear to confirm this hypothesis. The patient begins by feeling himself detached from everything, as in a dream. He experiences false recognition immediately afterwards, as he begins to be self-possessed again.[45]

Such then seems to be the defect in will which occasions false recognition. Such, at least, seems to be its deep source and furthest origin. As for its actual cause and mechanism, it must be sought in the combined play of perception and memory. False recognition results from the natural functioning of these two faculties, each allowed its own way. It would take place at every moment if the will, unceasingly striving towards action, did not prevent the present turning back on itself by continually pressing it forward into the future. The darting forward of consciousness, which reveals the life-impetus, escapes analysis by its simplicity. We can however study, in the moments when it slackens, the conditions of mobile equilibrium which till then it had maintained, and so analyse a manifestation which foreshadows its essence.

[45] See especially the analysis of Kräepelin, also that of Dromard and Albés, *art. cit.*

VI

INTELLECTUAL EFFORT

An Article in the "Revue Philosophique," January, 1902.

THE problem with which I am going to deal is distinct from the problem of attention as it has been discussed by recent psychology. When we call to mind past deeds, interpret present actions, understand a discourse, follow some one's train of thought, attend to our own thinking, whenever, in fact, our mind is occupied with a complex system of ideas, we feel we can take up two different attitudes, one of tension, the other of relaxation, and they are mainly distinguished by the feeling of effort which is present in the one and absent from the other. Is the play of ideas the same in each case? Are the intellectual elements of the same kind, and have they the same relations among themselves? Does not the idea itself, do not the internal reactions it brings about, the form, movement and grouping of the simpler states which constitute it, provide the means of distinguishing the thinking which simply lets itself live from the thinking which concentrates itself in an effort? Indeed, in the feeling we have of this effort, does not the conscious-

ness of a certain quite special *movement of ideas* count for something? These are the questions I have set myself to answer. They can all be summed up in asking: What is the intellectual characteristic of intellectual effort?

In whatever way we answer the question, we leave untouched the problem of attention as formulated in recent psychology. For psychologists have been mainly concerned with sensory attention, that is, the attention given to a simple perception. Now, as the simple perception accompanied by attention is a perception which would under favourable circumstances present the same content, or nearly so, if attention were not joined to it, it is outside this content that they have had to look for the specific character of attention. The idea, which Ribot suggested, of attributing decisive importance to the concomitant motor phenomena, and especially to actions of arrest, is likely to become classical in psychology. But, in proportion as a state of intellectual concentration is complicated, it becomes bound up with the effort which accompanies it. There are some mental works which cannot be conceived as performed with ease and facility. Could any one invent a new machine or even simply extract a square root without effort? The intellectual state, in such case, bears in some sort impressed upon it the mark of effort. This is as much as saying that there is here an intellectual characteristic of intellectual effort.

Now, if this character exists in ideas of a complex and superior order, there must be something of it to be discovered in the simpler states. It is not impossible, then, that we may discover traces of it even in sensory attention itself, although it probably becomes here an accessory and stands in the background.

To simplify the study, I will examine the different kinds of intellectual work separately, starting with the easiest, which is reproduction, and ending with the most difficult, which is production or invention. Let us deal first then with the effort of memory, or more exactly with the effort of recollection.

In *Matter and Memory* I showed that we must distinguish a series of different "planes of consciousness," beginning with the plane of "pure memory" not yet translated into distinct images, and going down to the plane where the same memory is actualized in nascent sensations and incipient movements. The voluntary calling up of a memory consists, I said, in traversing these planes of consciousness one after another in a definite direction. At the same time that the book appeared (1896), Witasek published an interesting and suggestive article (in the *Zeitschrift für Psychologie,* October 1896) in which the same mental work was defined as "a passage from the non-intuitive to the intuitive." Going back, then, to some points of my book, with the suggestion of Witasek's article, I will deal first, in the case of the recall of memories,

with the difference between the spontaneous and the voluntary ideas.

Speaking generally, whenever we learn a lesson by heart or try to fix a group of impressions in our memory, our one object is to retain what we learn. We do not trouble about what we shall have to do later in order to bring back to mind what we have learnt. The mechanism of the recall is indifferent to us; the essential thing is that we shall be able to evoke the memory, it matters not how, when we need it. This is why we use simultaneously or successively the most different processes, bringing our mechanical as well as our intellectual memory into play, juxtaposing between them auditive, visual and motor images and thus retaining them in their natural state, or else, on the contrary, substituting for them a simple idea which expresses their meaning and which enables us to reconstitute the series of them whenever we want to. And that is why, when the moment of recall comes, we recur neither to the reflective consciousness nor to the automatism exclusively, automatism and reflexion being so closely interwoven, image calling up image, while the mind is at work on less concrete ideas. Thence the extreme difficulty we experience in defining exactly the difference between the two attitudes the mind takes when it recalls mechanically all the parts of a complex memory and when, on the contrary, it actively reconstructs them. There is al-

most always partly mechanical recollection and partly intelligent reconstruction, and so completely mingled that we can never say where one begins and the other ends. However, some exceptional cases occur in which we set ourselves the task of learning a complicated lesson with the idea of its instantaneous and, so far as possible, mechanical recollection. On the other hand, there are cases in which we know that the lesson we are learning will never have to be recollected all at once, but that it must be the object of a slow and reflective reconstruction. Let us then first study these extreme cases. We shall see that we adopt quite different methods of retention according to the kind of recall it is to be. On the other hand, the two different kinds of work which we accomplish, whilst acquiring a memory, in order that an intellectual effort for recalling it shall become possible or, on the contrary, shall be rendered useless, may throw some light on the nature and conditions of the effort.

Robert Houdin, in a remarkable passage in *Confidences,* published in Paris, 1861 (vol. i. p. 8 f.), explains how he set about developing in his young son an intuitive and instantaneous memory. He began by showing the boy a domino, the five-four, asking him the total of the dots *without letting him count them.* He then set beside this domino another, the four-three, again requiring an immediate answer. This ended the first lesson. The next day he succeeded in

making him add at a single glance three or four dominoes; the day after, five; and with each day's progress added more until he was able to obtain instantly at sight the sum of dots on any twelve dominoes. "When we had gained this result, we set to work on a task of a different kind of difficulty, and gave ourselves up to it for more than a month. My son and I passed fairly quickly before a shop of children's toys or before one furnished with different kinds of commodities, casting on it an attentive look. A few steps beyond, we took a pencil and paper from our pocket and tried separately which of us could write down the greater number of the objects we had noticed in passing. . . . It often happened that my son would write down forty objects." The aim of this special education was to make the boy able to apprehend, in a single glance round an assembly-room, the objects which the individuals in the audience carried on their person. Then, with bandaged eyes, he simulated second-sight, describing on a conventional sign from his father an object chosen at random by one of the audience. This visual memory had developed to such a point that, after a few moments in front of a book-case, the boy would be able to retain a very great number of titles, with the exact place of the volumes. He took, as it were, a mental photograph of the whole, and this enabled him immediately to call up a direct recollection of the parts. But in the very first lesson,

and particularly in not allowing the boy to add the dots of the dominoes, we may see the principal spring of this memory education. All *interpretation* of the visual image was excluded from the act of seeing. The mind was kept on the plane of visual images.

To produce a memory habit of the same kind for the ear, we should have to leave the mind on the plane of auditive or articulatory images. Among the methods proposed for teaching languages, an important one is that of Prendergast,[1] the principle of which has been more than once utilized. It consists in making the pupil begin by pronouncing sentences the meaning of which he is not allowed to ask,— never isolated words, always complete propositions which he must repeat mechanically. If the pupil tries to guess the meaning, he spoils the result. If he hesitates for a moment, it has all to begin again. By varying the place of the words, by practising exchange of words among the sentences, it comes about that the meaning is caught of itself by the ear in some fashion without the understanding being mixed with it. The object is to obtain from memory an instantaneous and easy recall, and the contrivance consists in making the mind move as much as possible among images of sounds or articulations without the more abstract elements, external to the plane of sensations and movements, intervening.

[1] Prendergast, Thomas, *The Mastery Series* (London, 1868.)

The facility of recall of a complex memory seems, then, to be in direct proportion to the tendency of its elements to spread themselves out on one and the same plane of consciousness. Each of us can verify this for himself. Suppose a verse of poetry learnt in our school-days to have remained fixed in our memory. We perceive, in reciting it, that word calls up word, and that reflexion on the meaning hinders rather than helps the mechanism of recall. Memories, in such case, may be auditive or visual, but they are always at the same time motor. Indeed, it is difficult for us to distigunish between what is ear memory and what is habit of articulating. If we stop in the middle of the recitation, our feeling of " incompleteness " appears to consist sometimes in the fact that the remainder of the verse goes singing on in our memory, sometimes in the fact that the movement of articulation has not got to the end of its push and wants to complete it; sometimes, and more often, it is both at the same time. But we must notice that these two groups of memories,— auditive memories and motor memories,— are of the same order, equally concrete, equally near to sensation. They are, to use the expression already employed, on one and the same " plane of consciousness."

If, on the contrary, recall is accompanied by an effort, the mind is sure to be seen moving from one plane to another.

How, indeed, do we learn by heart when it is not instantaneous recall we have in view? Treatises on mnemonics tell us, but each of us can discover it for himself. We read the piece attentively, then we divide it into paragraphs or sections, paying particular attention to its internal organization. In this way we obtain a schematic view of the whole. Then we insert into the scheme the most noticeable expressions. To the dominant idea we attach the subordinate ideas, to the subordinate ideas the dominating and representative words, and lastly to these words the intermediate words which bind them together as in a chain. "The art of mnemonics consists in seizing in a passage of prose the salient ideas, the short sentences, the simple words which involve with them whole pages," [2] so one treatise expresses it. Another gives the following rule: "Reduce into short and substantial formulæ, . . . note in each formula the suggestive word, . . . associate all these words together and form in this way a logical chain of ideas." [3] Here, then, we no more attach together mechanically images to images, each intended to bring back that which comes after it; we jump to a point where the multiplicity of the images seems to be condensed into a single, simple and undivided idea. It is this idea we commit to memory. Then, when the moment of recall comes, we redescend

[2] Audibert, *Traité de mnémotechnie générale* (Paris 1840), p. 173.
[3] André, *Mnémotchnie rationnelle* (Angers, 1894).

from the top of the pyramid towards the base. We pass from the higher plane, in which all was gathered up into a single idea, to lower and lower planes, nearer and nearer to sensation, where the simple idea is dispersed in images, and where the images develop into sentences and words. But, then, recollection is no longer immediate and easy. It is accompanied by effort.

In this second method more time no doubt is required for recollecting, but less time is spent in learning. The perfecting of memory, it has very often been said, is not so much an increase of retentivity as a greater skill in sub-dividing, co-ordinating and enchaining ideas. The preacher quoted by William James (*Principles of Psychology,* i 668) says: "Before twenty, it took three or four days to commit an hour-long sermon; after twenty, two days, one day, half a day; and now one slow, analytic, very attentive or adhesive reading does it." The progress here is evidently only a growing aptitude to make all the ideas, all the images, all the words converge on one single point. It is getting hold of the gold coin, instead of having the silver or copper change for it.

What is the gold coin? How are so many different images held together implicitly in one simple idea? I shall have to come back to this point. Let me first suggest a term by which to characterize the simpler idea which is able to develop into multiple images.

Let me say, borrowing from the Greek, that it is a *dynamic scheme.* I mean by this, that the idea does not contain the images themselves so much as the indication of what we must do to reconstruct them. It is not an extract of the images, got by improverishing each of them; if it were, I should not understand why the scheme enables us, as it does in so many cases, to recover the images integrally. It is not either — or at least it is not only — the abstract idea of what all the images, taken together, mean. Doubtless the idea of the meaning has a large place in it; but, besides being difficult to say what this idea of the meaning of the images becomes when we detach it completely from the images themselves, it is clear that the same logical meaning may belong to quite different series of images, and that consequently it would not be enough to make us retain and reconstruct one definite series of images to the exclusion of others. The scheme is something not easy to define, but of which each of us has the feeling and of which we shall understand the nature if we compare with one another different kinds of memories, especially technical or professional memories. I will not enter here into detail. I will, however, call attention to a kind of memory which in recent years has been the object of specially careful investigation — the memory of chess-players.[4]

[4] Binet, *Psychologie des grands calculateurs et joueurs d'échecs* (Paris, 1894).

A skilful chess-player may be able to play several games at once without looking at the chess-boards. At each move of one of his opponents, the new position of the piece moved is indicated to the player. He then moves a piece on his side, and thus, playing blindly, picturing mentally at each moment the respective positions of all the pieces on all the chess-boards, he is able to win, often against good players, games simultaneously played. Taine, in a well-known passage in *L'Intelligence* (vol. i. p. 81), has given a theory of the way the feat is performed: he derived it from indications furnished by a player, one of his own friends. According to this theory, the player uses here a purely visual memory. He perceives continuously, "as in an inner mirror," the image of each of the chess-boards with its pieces as it appears with each new move.

Alfred Binet, however, investigated the mental procedure in the case of a number of blindfold players, and reached a quite definite and entirely different conclusion. The image of the chess-board with its pieces is not presented to the memory, clean cut and ready made, "as in a mirror," but at every move in the games the player has to make an effort of reconstruction. What is that effort? What are the elements actually present in the memory? On this point the investigation yielded unexpected results. The players all agreed that a mental vision of the pieces

themselves would be more disturbing to them than useful. What they keep in mind is not the external aspect of each piece, but its power, its bearing and its value, in fact its function. A bishop is not a piece of wood of more or less fantastic shape: it is an "oblique force." The castle is a certain power of "going in a straight line." The knight, a piece "which is almost equal to three pawns and which moves according to a quite special law," and so on. So much for the pieces. Now for the game. What is present to the mind of the player is a composition of forces, or rather a relation between allied or hostile powers. The player remarkes mentally the history of the game from the beginning. He reconstitutes the successive events which have brought about the present situation. He thus obtains an idea of the whole which enables him at any moment to visualize the elements. That abstract idea is moreover *one*. It implies reciprocal penetration of all the elements in one another. What proves it is that each game appears to the player with a character entirely its own. It gives him an impression *sui generis*. "I grasp it as a musician grasps a chord," so one of the players described it. And it is just this difference of physiognomical expression, so to say, which enables the player to keep several games in mind without confusing them. So then, here again, there is an ideal scheme of the whole, and this scheme is neither an

extract nor a summary. It is as complete as the image will be when called up, but it contains, in the estate of reciprocal implication, what the image will evolve into parts external to one another.

Analyse your effort when you find difficulty in evoking a simple memory. You start with an idea in which you feel there are very different dynamical elements implied in one another. This reciprocal implication, and consequent internal complication, is so necessary, it is so much the essence of the schematic idea, that if it be just a simple image you are trying to evoke, the scheme may not be nearly so simple. I need not go far for an illustration. Some time ago, when jotting down the plan of the present article and noting the list of works to consult, I wanted to include the name of Prendergast, the author whose intuitive method I have spoken of and whose articles on memory, among others, I had previously read. But I could not think of this name, nor recollect the work in which I had first seen it. I remember pretty well the phases of the work by which I tried to evoke the recalcitrant name. I started with the general impression which I had of it. It was an impression of strangeness, but not of strangeness *in general,*— rather of a certain definite kind of strangeness. There was, as it were, a dominant note of barbarism, rapine, the feeling that would have been left on one by the sight of a bird of prey pouncing on its victim, gripping it in its claws,

carrying it off. I now say to myself that the word "prendre" (snatch), which was almost figured by the two first syllables of the name I was trying to think of, must have had a large share in my impression. But I do not know if this resemblance would have been enough to determine a shade of feeling so precise, and in seeing with what obstinacy the name of "Arbogaste" comes up today to my mind when I think of "Prendergast," I ask myself whether perhaps I had not blended together the general idea of "prendre" and the name of "Arbogaste." This name, which goes back to the time when I learned Roman History, evoked in my memory vague images of barbarism. I am not sure, however, and all I can affirm is that the impression left on my mind was absolutely *sui generis*, and that it tended, in spite of innumerable difficulties, to transform itself into a proper name. It was especially the letters *d* and *r* which were brought back to my memory by that impression. But they were not brought back as visual or auditive images, or even as ready-formed motor images. They presented themselves especially as indicating a certain *direction of effort* to follow in order to get at the articulation of the name I was trying to think of. It seemed to me, — wrongly moreover,— that these letters must be the first letters of the word, just because they had the appearance of pointing out to me a road. I said to myself that in trying with them the different vowels by

turn, I should succeed in pronouncing the first syllable, and so get an impetus which would carry me all along the actual word. Would such a work have ended successfully? I do not know, for it had not gone very far when suddenly it came into my mind that the name occurred in a note of a book by Kay on the education of memory, and that it was there, moreover, that I had become acquainted with it. It is there that I went at once to find it. Perhaps the sudden resurrection of the useful memory was the effect of chance; but perhaps also the work which was destined to convert the scheme into an image had passed beyond its end, evoking, instead of the image itself, the circumstances which had originally enframed it.

In these examples, the effort of memory appears to have as its essence the evolving of a scheme, if not simple at least concentrated, into an image with distinct elements more or less independent of one another. When we let our memory wander at will without effort, images succeed images, all situated on one and the same plane of consciousness. On the other hand, when we make an effort to recollect, it seems that we are concentrating on a higher plane in order to descend progressively towards the images we want to evoke. If, in the first case, associating images with images, we move on a single plane with a movement which I will call horizontal, then in the second case we must say that the movement is vertical and

that it makes us pass from one plane to another. In the first case, the images are homogeneous among themselves, but the objects represented by the images are different; in the second, there is but one identical object throughout all stages of the operation, but it is represented differently,— I mean represented by heterogeneous intellectual states, sometimes schemes and sometimes images, the scheme striving towards the image in proportion as the descending movement is accentuated. In short, each of us has the very distinct feeling of an operation which is carried out in extension and superficially in the one case, in intensity and in depth on the other.

It is rare, moreover, that the two operations are perfectly distinct, pure and unalloyed. Most acts of recollection are at the same time a descent of the scheme towards the image, and a moving of the mind among the images themselves. This amounts to saying, as I indicated at the beginning of this study, that an act of memory ordinarily includes a part which is effort and a part which is automatism. I am thinking at this moment of a long journey which I made some years ago. The incidents of the journey come to my mind in no particular order, one mechanically calls up others. But if I make an effort to remember a particular period, then I go from the whole of the period to the parts which compose it, the whole appearing to me at first as an individual scheme, having its particular

affective colour and tone. Often, too, the images which have been simply called up one after another in my mind bid me go to the scheme to complete them. But whenever I have the feeling of effort, I find myself travelling from the scheme to the image.

So far, then, we may conclude that *the effort of recall consists in converting a schematic idea, whose elements interpenetrate, into an imaged idea, the parts of which are juxtaposed.*

We must now study the effort of intellection in general, the effort we have to put forth in order to comprehend and interpret. I will confine myself here to a few hints, referring for the rest to my former work (*Matter and Memory,* pp. 89–141).

Intellection is continually going on; it is not easy, therefore, to say where intellectual effort begins and where it ends. All the same, there is a certain kind of understanding and interpreting which works without effort, while there is another kind which, though not necessarily implying effort, is generally to be found when an effort is being made.

Intellection of the first kind consists, when confronted with a perception, in responding automatically by an appropriate act. What is recognizing an ordinary object, if not knowing how to use it? And what is "knowing how to use" but, when we have a perception, sketching mechanically the action which

custom has associated with it? The first observers of psychical blindness gave it the name of *apraxia,* expressing thereby that inaptitude in recognizing ordinary objects is above all inability to use them.[5] This completely automatic intellection extends much farther than we imagine. Current conversation is composed in great part of ready-made responses to conventional questions, the response succeeding the question without intelligence being interested in the meaning of either. Thus, patients in a state of *dementia* can keep up an almost coherent conversation on a simple subject, although they hardly know what they are saying.[6] We sometimes find ourselves stringing words together, guiding ourselves as it were by the compatibility or incompatibility of their musical sound, and so forming correct sentences without our intelligence being concerned in the matter at all. In such cases, the interpretation of sensations is made at once by movements. The mind remains on one and the same "plane of consciousness."

Quite different is true intellection. It consists in a movement of the mind continually coming and going between perceptions or images, on the one hand, and

[5] Kussmaul, *Die Störungen der Sprache*; Allen Starr, "Apraxia and Aphasia," *Medical Record* (Oct. 1888). Cf Laquer, *Neurologisches Centralblatt* (June 1888); Nodet, *Les Agnoscies* (Paris, 1899); and Claparède, "Revue générale sur l'Agnoscie," *Année psychologique* (1900), vi. pp. 85 ff.

[6] Robertson, "Reflex Speech," *Journal of Mental Science* (April 1888); Féré, "Le Langage réflexe," *Revue philosophique* (Jan. 1896).

their *meaning,* on the other. What is the essential direction of this movement? We might suppose that in this case we start with images and proceed to the discovery of their meaning, because there are some images which are given first of all and because "understanding" consists in interpreting perceptions or images. Whether we are following an argument, reading a book or listening to a discourse, there are always perceptions or images which are presented to the mind for it to translate into relations, as though it must go from the concrete to the abstract. But this is no more than an appearance, and it is easy to see that in fact the mind does the exact opposite in the work of interpretation.

It is evident in the case of mathematical calculation. Can we follow a calculation except by going over it on our own account? Do we understand the solution of a problem except by solving the problem in our turn? The calculation is exposed on the black-board, the solution is printed or explained *viva voce;* but the figures and signs we see are only finger-posts to which we refer to ensure that we are not on the wrong road; the sentences that we read or hear have a complete meaning only when we are able to make them up ourselves, to create them anew, so to say, by drawing from ourselves the expression of the mathematical truth which they teach. All along the argument that we are hearing or reading we catch a few hints, choose

a few guiding marks. From these visual or auditive images we jump to abstract ideas of relation. Then, setting out from these ideas, we evolve them into imagined words which coalesce with the words we are reading or hearing.

Now, is it not the same with any work of interpretation whatsoever? We argue sometimes as though reading and listening consisted in using the words seen or heard as spring-boards from each of which we jump to the corresponding idea, and then set the ideas side by side. The experimental study of reading and of hearing words shows us that what happens is quite different. In the first place, in current reading all that we see of a word amounts to a very small matter, a letter or two — less than that even, a few strokes or characteristic features. The experiments of Cattell, Goldscheider and Müller, Pillsbury (criticized, it is true, by Erdmann and Dodge) seem to be conclusive on this point. No less instructive are Bagley's experiments on the hearing of speech; they completely confirm the fact that what we hear is only a part of the words pronounced. But, apart from any scientific experiment, every one knows the impossibility of perceiving distinctly the words of a foreign language with which one is unfamiliar. The fact is that mere vision and hearing are limited in such case to furnishing us with guiding marks, or rather to drawing an outline which we fill in with memories. It is a great mistake,

when describing here the mechanism of recognition, to suppose that we begin by seeing and hearing, and that afterwards, having got the perception, we go looking for a memory like it in order to recognize it. The fact is that it is the memory which makes us see and hear, and the perception is incapable by itself of evoking the memory which resembles it, because, to do that, it must have already taken form and itself be complete; now, it only becomes complete and acquires a distinct form through that very memory, which slips into it and supplies most of its content. If this be so, then, it must be the *meaning*, before everything, which guides us in the reconstruction of forms and sounds. What we see of the sentence read, what we hear of the sentence spoken, is only what is necessary to place us in the corresponding class of ideas. Then, setting out from ideas,— that is to say, from abstract relations,— we materialize them imaginatively in hypothetical words which try whether they can cover exactly what we see and hear. Interpretation is therefore, in reality, a reconstruction. A slight contact with the images actually perceived throws abstract thinking into a definite direction. The abstract thought then develops into complete images, merely represented, which in their turn come and touch the perceived images, follow them as they go along, endeavour to coalesce with them. Where coincidence is perfect, the perception is perfectly interpreted.

This work of interpretation is too rapid, when we hear our own language, to allow us time to decompose it into its different phases. But we have the clear consciousness of it when we converse in a foreign language which we know only imperfectly. We realize, then, that the sounds distinctly heard are being used by us as guiding marks, that we jump at once to a certain class of abstract ideas, and that, when we have adopted this intellectual *tone,* we advance with the conceived meaning, to meet the perceived sound. If the interpretation is to be exact, the one must be able to join the other.

Indeed, would interpretation be possible if we had to go from words to ideas? The words of a sentence have not an absolute meaning. Each of them borrows a special import from what precedes it and from what follows it. Nor are all the words of a sentence capable of evoking an independent image or idea. Many of them express relations, and express them only by their place in the whole and by their connexion with the other words of the sentence. Had the mind constantly to go from the word to the idea, it would be always perplexed and, so to say, wandering. Intellection can only be straight and sure if we set out from the supposed meaning, constructed by us hypothetically, then descend from the meaning to the fragments of words really perceived, and then make use of these as

simple stakes to peg out in all its sinuosities the special curve of the road which the mind is to follow.

I cannot deal with the problem of sensory attention, but I think that voluntary attention,— attention which is or may be accompanied by a feeling of effort, — differs precisely here from mechanical attention in this, that it puts in operation psychical elements situated on different planes of consciousness. When we pay attention mechanically, certain movements and attitudes favourable to distinct perception respond to the appeal of confused perception. But it does not seem that there is ever voluntary attention without a "preperception," to use the word proposed by G. H. Lewes,[7] that is to say, without an idea, which may be an anticipated image, or even something more abstract,— for instance, a hypothesis relative to the meaning of what we are about to perceive and the probable relation of that perception to certain elements of our past experience. There has been much dispute as to the true nature of the oscillation of attention. Some hold that the phenomenon has a central, others that it has a peripheral, origin. But, even if we do not wholly accept the central origin theory, we must admit that there can be no attention without a certain eccentric projection of images which descend towards percep-

[7] G. H. Lewes, *Problems of Life and Mind* (London, 1879), vol. iii. p. 106.

tion. Only in this way can we explain the effect of attention, whether it be to intensify the image, as some writers maintain, or only, as others think, to render it clearer and more distinct. Would it be possible to understand the gradual *enrichment* of perception by attention if the bare perception were more than a mere hint, an appeal mainly addressed to memory? The bare perception of the parts suggests a schematic idea of the whole, and thereby of the relations of the parts to one another. Developing this scheme into memory-images, we try to make these memory-images coincide with the images perceived. If we do not succeed, straight we go to some other idea, some other scheme, from which we shall also gradually descend. Here, again, the positive, useful part of the work is the going from the scheme to the image perceived.

The intellectual effort to interpret, to comprehend, to pay attention, is then a movement of the " dynamic scheme " in the direction of the image which develops it. It is a continuous transformation of abstract relations, suggested by the objects perceived, into concrete images capable of recovering those objects. No doubt a feeling of effort does not always intervene during this operation. We shall see presently in what particular circumstances the operation takes place whenever an effort is to be found accompanying it. But it is only during such an operation that we can become conscious of an intellectual effort. *The feel-*

ing of effort, in intellection, is produced on the passage from the scheme to the image.

I have now to verify this law in the case of the highest forms of intellectual effort — I mean in the effort of invention. As Ribot has observed, to create imaginatively is to solve a problem.[8] Now, what other way is there of solving a problem than by supposing it already solved? We set before ourselves, as Ribot says, a certain ideal, that is, we present to our mind a certain effect as already obtained, and then we seek to discover by what composition of elements we can obtain it. We pass at a bound to the complete result, to the end we want to realize, and the whole effort of invention is then an attempt to fill up the gap over which we have leapt, and to reach anew that same end by following, this time, the continuous thread of the means which will realize. But how is it possible to know the end without the means, the whole without the parts? We cannot know this end or whole under the form of an image, because an image which would make us see the effect being brought about would show us, within the image itself, the means by which the effect is obtained. It must necessarily be assumed, then, that the whole is presented as a scheme, and that invention consists precisely in converting the scheme into image.

[8] Ribot, *L'Imagination créatrice* (Paris, 1900), p. 130.

The inventor who wishes to construct a certain machine forms an idea of the work it is to do. The abstract form of this work evokes successively in his mind, by means of tentative experiments, the concrete form of the different elementary movements which will realize the total movement, then the parts and combinations of parts of the machine which will produce these elementary movements. It is precisely at this moment that the invention takes form: the schematic idea has become an imaged idea. The author writing a novel, the dramatist creating his characters and situations, the musician composing a symphony, the poet composing an epic, all have in mind, first of all, something simple and abstract, something, so to say, incorporeal. For the musician and poet it is a new impression, which they must unfold in sounds or in imagery. For the novelist and the dramatist it is a theme to be developed into events, a feeling, individual or social, to be materialized in living personages. They start work with a scheme of the whole, and the end is obtained when they reach a distinct image of the elements. M. Paulhan has shown by some highly interesting examples how literary and poetic invention thus proceeds "from the abstract to the concrete"; that is to say, from the whole to the parts, from the scheme to the image.[9]

We must not believe, however, that the scheme

[9] Paulhan, *Psychologie de l'invention* (Paris, 1901), ch. iv.

remains unchanged throughout the operation. It is modified by the very images by which it endeavours to be filled in. Sometimes there remains nothing of the primitive scheme in the final image. The inventor, whilst working out the details of his machine, finds himself continually giving up some part of what he wanted or getting it to do something else. The characters which the poet or the novelist creates are always reacting on the idea or the feeling which they are intended to express. In this especially is the part of the unforeseen; it is, we might say, in the movement by which the image turns round towards the scheme in order to modify or transform it. But effort, in the strict meaning of the word, is only to be found on the way from the scheme, whether unchanged or changing, to the images which will fill it in.

Nor is it necessary that the scheme should always explicitly precede the image. Ribot has shown that we must distinguish two forms of creative imagination — one intuitive, the other reflective. "The first proceeds from the unity to the details . . . the second goes from the details to the unity vaguely apprehended. It begins with a fragment which lures it on, and is gradually completed. . . . Kepler spent part of his life in trying to work out extravagant hypotheses until one day, discovering the elliptical orbit of Mars, all his former work took shape and organized itself into a system." In other words, in place of a single

scheme with fixed and rigid lines, given to us immediately in a distinct concept, we may have an elastic or mobile scheme the contours of which our mind will not fix, because it will get the suggestion of the definite shape from the very images which the scheme is calling up in order to be embodied in them. But, fixed or mobile, it is while the scheme is developing into images that there arises the feeling of intellectual effort.

Bringing these arguments into line with the former, we get a formula of intellectual work — that is, of the movement of the mind which can, in certain cases, be accompanied by a feeling of effort. *To work intellectually is to take one and the same idea and lead it through different planes of consciousness, in a direction which goes from the abstract to the concrete, from the scheme to the image.* What we now have to ascertain is in what special cases this movement of the mind (which perhaps always includes a feeling of effort, though often so slight or so familiar that it is not distinctly perceived), gives us the clear consciousness of an intellectual effort.

To this question simple common sense replies that there is effort, in addition to work, when the work is difficult. But by what sign do we recognize the difficulty of the work? By the fact that the work does not "go of itself," that it meets with a hindrance or an obstacle, or that it takes more time than we should

wish to give in order to attain the end. Effort means that there is a slowing and holding back. On the other hand, we may install ourselves in the scheme and wait indefinitely for the image, or we may slacken the work indefinitely, without any consciousness of an effort. It must then be on the way in which our waiting-time is filled that the feeling of effort depends, that is to say, on the quite special diversity of states which follow one another in the waiting-time. What are those states? I have just said that there is a movement from the scheme to the images, and that the mind is at work only when converting the scheme into images. The states which follow one another must therefore correspond to so many trial efforts of the images to get inserted in the scheme, or again, in certain cases at least, to so many modifications undergone by the scheme in order to get itself translated into images. In this peculiar kind of hesitation is likely to be found the characteristic of intellectual effort.

I cannot do better than reproduce here, adapting it to my present purpose, an interesting and profound idea put forward by Professor Dewey in his article on the psychology of effort.[10] There is effort, according to Professor Dewey, whenever we use acquired habits to learn a new exercise. In particular, in the case of bodily exercise, we can only learn it by utilizing

[10] Dewey, "The Psychology of Effort," *Philosophical Review* (Jan. 1897).

or modifying movements to which we are already accustomed. But the old habit is still there, and it resists the new habit we wish to set up by means of it. Effort simply exhibits this struggle of two habits at once different and alike.

Let me express this same idea in terms of schemes and images. I will apply my formula to bodily effort of the kind which Dewey has in mind, and see whether bodily and intellectual effort do not throw light on one another.

When we want to learn, unaided, a complex exercise such as dancing, how do we set about it? We begin by looking at people dancing. In this way we get a visual perception, say, of the waltz-movement, if that be what we are wanting to learn. This perception we confide to our memory, and our aim, then, is to get our limbs to perform movements which will give our eyes an impression like that which we remember having seen. But what is that impression? Can we say that it is the clear, definitive, perfect image of the waltz-movement? That would imply that we can perceive exactly the movement of the waltz when we do not know how to waltz. Now it is quite clear that if, in order to learn the dance, we must begin by seeing it danced, on the other hand we can only see it, in its details and even as a whole, when we have learnt to some extent to dance it. The image which we are going to use is not, then, a clean-cut visual image; it is

not clean cut, because it is to vary and grow precise in the course of the learning which it is its business to direct; neither is it entirely visual, because, if it becomes perfected in the course of the learning,— that is to say, in the course of our acquiring the appropriate motor images — the reason is that these motor images, called up by the visual image, but more precise than the visual image, invade it and gradually take its place. In fact, the useful part of the image is neither purely visual nor purely motor; it is both at once, being the outline of the *relations,* especially temporal, between the successive parts of the movement to be executed. An image of this kind, which exhibits relations rather than things, is very like what I have called a scheme.

Now, we only begin to know how to dance when this scheme, supposed complete, has obtained from our body the successive movements the model of which it set before us. In other words, the scheme, an idea more and more abstract of the movement to be carried out, must fill itself with all the motor sensations which correspond to the movement being carried out. This it can only do by evoking one by one the ideas of these sensations or, in the words of Bastian the "kinaesthetic images," of the partial, elementary movements composing the total movement: these memories of motor sensations, to the extent that they are revivified, are converted into actual motor sensa-

tions, and consequently into movements actually accomplished. Of these motor images, then, we must have been already possessed. So it comes to this: in order to contract the habit of a complex movement like the waltz, we must already have the habit of the elementary movements into which the waltz can be decomposed. In fact, it is easy to see that the movements to which we resort for walking, for raising ourselves on the point of the toes, for turning round, are just those which we utilize in order to learn how to waltz. But we do no utilize them exactly as they are. It is necessary to modify them more or less, to inflect each of them with the general direction of the waltz-movement, and especially to combine them together in a new manner. There is, then, on the one hand, the schematic idea of the total movement which is new, and, on the other hand, the kinaesthetic images of some old movements, identical or analogous to the elementary movements into which the total movement has been analysed. Learning the waltz consists in getting from these different kinaesthetic images, already old, a new systematization which will allow all of them together to be inserted in the scheme. Here again, then, we have to do with the developing of a scheme into images. But the old grouping struggles against the new grouping. The habit of walking, for example, interferes with the attempt to dance. The total kinaesthetic image of walking prevents us from

getting at once the elementary kinaesthetic images of walking to combine with others and form the total kinaesthetic image of the dance. The scheme of the dance does not succeed right away in filling itself with appropriate images. Does not this delay, caused by the necessity in which the scheme finds itself of bringing gradually the manifold elementary images to a new *modus vivendi* among themselves, caused also, in many cases, by modifications which the scheme itself undergoes in order to become capable of developing into images — this delay *sui generis* made up of tentatives, of more or less fruitful trials, adapting images to the scheme and the scheme to images, letting the ideas interact and intermingle — does not this delay measure the interval between the difficult attempt and the easy execution, between the learning and the doing of the exercise?

Now, it is easy to see that the same kind of process occurs in every effort to learn and to understand, in all intellectual effort. Consider the effort of memory. I have endeavoured to show that it is produced in the transition from the scheme to the image. But there are cases where the development of the scheme into the image is immediate, because one image alone presents itself to perform that duty. And there are other cases where many images, analogous to one another, present themselves concurrently. In general, when several different images are competitors, it means that

none of them entirely fulfils the conditions laid down by the scheme. And that is why, in such case, the scheme may have to modify itself in order to obtain development into images. Thus, when I want to recall a proper name, I turn first to the general impression which I have kept of it; this is what will act as the "dynamic scheme." At once different elementary images, corresponding, for example, to certain letters of the alphabet, present themselves to my mind. These letters seek either to form a whole together or to substitute themselves for one another, in any way to organize themselves according to the indications of the scheme. But often, in the course of the work, there is revealed the impossibility of reaching any form of living organization. Hence a gradual modification of the scheme — a modification required by the very images which the scheme has aroused and which may yet indeed have to be transformed or even to disappear in their turn. But whether the images simply manage it between themselves or whether scheme and images have to make reciprocal concessions to one another, the effort of recall always implies an interval, gradually filled in or diminished, between the scheme and the images. The more this bringing together needs goings and comings, oscillations, struggle and negotiation, the more the feeling of effort is accentuated.

Nowhere is this work so visible as in the effort of

invention. Here we have the distinct feeling of a form of organization, variable no doubt, but anterior to the elements which must be organized, then of a competition between the elements themselves, and lastly, if we succeed in inventing, of an equilibrium which is a reciprocal adaptation of the form and of the matter. The scheme varies from one of these periods to the other; but in each of the periods it remains relatively unchanged, and it is the business of the images to fit into it. It is just as though we had to stretch a piece of Indiarubber in different directions at the same time in order to bring it to the geometrical form of a particular polygon. It shrinks at some points, according as it is lengthened at others. We have to begin over and over again, each time fixing the partial result obtained; we may even have, during the operation, to modify the form first assigned to the polygon. So is it with the effort of invention, whether it take seconds or whether it require years.

Now, does this coming and going between the scheme and the images, this play of the images agreeing or quarrelling among themselves to enter the scheme, in short, does this particular movement of ideas form an integral part of the *feeling* that we have of effort? If this play of images is present whenever we experience the feeling of intellectual effort, if it is absent when that feeling is absent, can we think that it has nothing to do with the feeling itself? But then,

on the other hand, how can a play of images, a movement of ideas, enter into the composition of a feeling? Recent psychology inclines to resolve into peripheral sensations whatever is affective in affection. And even if we do not go so far, still it seems that affection is irreducible to ideation. What, then, is exactly the relation between the affective tone which colours all intellectual effort and the very special play of ideas which analysis discovers in it?

I am quite ready to grant that in attention, in reflexion and generally in intellectual effort, the affection experienced can be resolved into peripheral sensations. But it does not therefore follow that the "play of ideas" I have indicated as characteristic of intellectual effort does not also make itself felt in that affection. We can agree to both, if only we assume that the play of sensations responds to the play of ideas and is an echo of it, so to say, in another tone. That is the easier to understand inasmuch as we are not in fact dealing here with an idea, but with a *movement of ideas,* with a struggle or with an interference of ideas with one another. We may conceive that these mental oscillations have their sensory harmonics. We may conceive that this indecision of the mind is continued in a *disquietude* of the body. The characteristic sensations of intellectual effort are likely to express that very suspension and disquietude. In a general way, may we not say that the peripheral sensations which

analysis discovers in an emotion are always more or less symbolical of the ideas to which that emotion is attached, and from which it is derived? We have a tendency to *play* our thoughts externally, and the consciousness we have of this play going on is sent back to the thought by a kind of ricochet. Thus arises the emotion, which usually has an idea as its centre, but in which there are especially visible the sensations in which that idea is prolonged. Sensations and idea are moreover so continuous here with each other that we can never say where the idea ends or where the sensations begin. And that is why consciousness, placing itself midway and contented with the mean, erects the feeling into a *sui generis* state intermediate between the sensation and the idea. But I shall not press this. The problem that I have raised can hardly be solved in the present state of psychological science.

It remains, in conclusion, to show that this conception of mental effort takes account of the principal effects of intellectual work, and that it is at the same time that which most nearly approaches pure and simple description of fact and has least resemblance to a *theory*.

It is an acknowledged fact that effort gives to the idea greater clearness and distinction. Now, an idea is the clearer the greater the number of details that

stand out in it, and it is the more distinct the better it is isolated and differentiated from all the others. But if mental effort consist in a series of actions and reactions between a scheme and images, we should just expect this inward movement on the one hand to isolate the idea and on the other hand to increase its content. The idea is isolated from all the others, because the organizing scheme rejects the images which are not capable of developing it and confers thus a real individuality on the present content of the consciousness. On the other hand, it fills itself with an increasing number of details, because the development of the scheme is brought about by the absorption of all the memories and all the images which the scheme can assimilate. Thus, in the relatively simple intellectual effort in which consists the attention given to a perception, it seems indeed, as I said, that the pure perception begins by suggesting a hypothesis intended to interpret it, and that this scheme then draws to it manifold memories which it tries on the various parts of the perception itself. The perception, then, enriches itself with all the details evoked by the memory of images, whilst it remains distinguished from all other perceptions by the one unchanged label, so to say, which the scheme has affixed to it from the very beginning.

It has been said that attention is a state of "monoideism!" [11] and it has been noticed, on the other hand,

[11] Ribot, *Psychologie de l'Attention*, p. 6 (Paris, 1889).

that the richness of a mental state is in proportion to the effort to which it bears witness. These two views are easily reconciled together. In all intellectual effort there is a multiplicity, visible or latent, of images which crowd and press to enter into a scheme. But, the scheme being relatively one and invariable, the manifold images which aspire to fill it are either analogous to one another or co-ordinated with one another. There is, then, mental effort only where there are intellectual elements on their way to organization. In this meaning, every mental effort is indeed a tendency to monoideism, but the unity towards which the mind moves is not in that case an abstract unity, dry and void; it is the unity of a " directive idea " common to a great number of organized elements. It is the very unity of life.

From a misunderstanding of the nature of this unity have arisen the principal difficulties which surround the question of intellectual effort. There is no doubt that this effort " concentrates " the mind and makes it bear on a " single " idea. But it does not follow, because an idea is *single,* that it is also *simple.* It may, on the contrary, be complex, and we have shown that there is always complexity when the mind makes effort: in that, indeed, is to be found the characteristic of intellectual effort. This is why I have thought it possible to explain the effort of the intellect without going out of the intellect, simply by a certain com-

position, or by a certain interference, of intellectual elements among themselves. But if we take unity to imply simplicity, if we suppose that intellectual effort can bear on a simple idea and the idea remain simple, how are we to distinguish an idea when it is laboured from the same idea when it is easy? How will the state of intellectual tension differ from the state of intellectual relaxation? We shall have to look for the difference outside the idea itself. We shall have to make it reside either in the affective accompaniment of the idea or in the intervention of a "force" external to intelligence. But, then, neither this affective accompaniment nor this indefinable supplement of force will explain how and why intellectual effort is efficacious. When the time comes to give an account of the efficacy, it will be necessary to leave out everything which is not idea, place oneself confronting the idea itself, and look for an *internal* difference between the purely passive idea and the same idea accompanied by effort. And then we must necessarily perceive that the idea is composite, and that its elements have not in each case the same relation between them. But, if the internal contexture differs, why seek elsewhere than in this difference the characteristic of intellectual effort? Since we must always end by recognizing that difference, why not begin with it? And if the internal movement of the elements of the idea account both for what is laborious and for what

is efficacious in intellectual effort, why not see in the movement the very essence of the effort?

Will it be said that I am postulating the duality of *scheme* and *image,* and also an *action* of one of these elements on the other?

But, in the first place, there is nothing mysterious nor even hypothetical about the scheme. There is nothing in it which need shock the susceptibilities of a professional psychologist, accustomed to resolve ideas into images, or at least to define any idea by its relation to images real or possible. It is indeed as a function of real or possible images that the mental scheme, such as it has appeared throughout this essay, should be defined. It consists in an *expectation* of images, in an intellectual attitude intended sometimes to prepare the advent of one definite image, as in the case of memory, sometimes to organize a more or less prolonged play among the images capable of inserting themselves in it, as in the case of creative imagination. The scheme is tentatively what the image is decisively. It presents in terms of *becoming,* dynamically, what the images give us statically as *already made.* Present and acting in the work of calling up images, it draws back and disappears behind the images once evoked, its work being then accomplished. The image, with its fixed outline, pictures what has been. A mind working only with images could but recommence its past or arrange the congealed

elements of the past, like pieces of mosaic, in another order. But for a flexible mind, capable of utilizing its past experience by bending it back along the lines of the present, there must, besides the image, be an idea of a different kind, always capable of being realized into images, but always distinct from them. The scheme is nothing else.

The existence of this scheme is fact. It is the reduction of all ideation to clean-cut images, copied from external objects, which is hypothesis. Let me add that nowhere is the insufficiency of the hypothesis so clearly shown as in the subject with which we are dealing. If images constitute the whole of our mental life, how is the state of mental concentration differentiated from the state of intellectual dispersion? We must suppose that in certain cases they succeed one another without any common intention, and that in other cases, by some inexplicable chance, all the images, simultaneous and successive, group themselves in a manner which offers an ever nearer approach to the solution of one and the same problem. Shall we be told that it is not chance, but the resemblance of the images, which makes them call up one another, mechanically, according to a general law of association? But, in the case of intellectual effort, the images which follow one another may just have no real external likeness among themselves. Their resemblance may be wholly internal; it is an identity of meaning, an equal

capacity of solving a problem towards which they occupy analogous or complementary positions, despite their differences of concrete form. The problem itself, therefore, must be standing before the mind, not at all as an image. Were it itself an image, it would evoke images resembling it and resembling one another. But since its task is, on the contrary, to call up and group images according to their power of solving the difficulty, it must consider this power of the images and not their external and apparent form. It is therefore a mode of presentation distinct from the imaged presentation, although it can only be defined in relation to mental imagery.

It is futile to object that there is difficulty in conceiving the action of the scheme on the images. Is the action of an image on an image any clearer? When we are told that images attract each other by reason of their resemblance, are we carried beyond pure and simple description of fact? All I ask is that no part of experience shall be neglected. Besides the influence of image on image, there is the attraction or the impulsion exercised on the images by the scheme. Besides the development of the mind on one single plane, on the surface, there is the movement of the mind which goes from one plane to another, deeper down. Besides the mechanism of association, there is that of mental effort. The forces at work in the two cases do not simply differ in intensity, they differ in their direc-

tion. As to knowing *how* they work, this is a question which does not only concern psychology; it is part of the general and metaphysical problem of causality. Between impulsion and attraction, between the efficient cause and the final cause, there is, I hold, something intermediate, a form of activity from which philosophers have drawn, by way of impoverishment and dissociation, in passing to the two opposite and extreme limits, the idea of efficient cause on the one hand and of final cause on the other. This operation, which is the very operation of life, consists in the gradual passage from the less realized to the more realized, from the intensive to the extensive, from a reciprocal implication of parts to their juxtaposition. Intellectual effort is something of this kind. In analysing it, I have pressed as far as I could, on the simplest and at the same time the most abstract example, the growing materialization of the immaterial which is characteristic of vital activity.

VII

BRAIN AND THOUGHT: A PHILOSOPHICAL ILLUSION

A paper read at the International Congress of Philosophy at Geneva in 1904, and published in the "Revue de métaphysique et de morale" under the title "Le Paralogisme psycho-physiologique."

THE idea that there is an equivalence between a psychic state and its corresponding cerebral state is widely accepted in modern philosophy. Philosophers have discussed the causes and the significance of this equivalence rather than the equivalence itself. By some, it has been held that the cerebral state is reduplicated in certain cases by a psychical phosphorescence which illumines its outline. By others, it is supposed that the cerebral state and the psychic state form respectively two series of phenomena which correspond point to point, without it being necessary to attribute to the cerebral series the creation of the psychic. All, however, agree in admitting an equivalence or, as it is more usual to say, a *parallelism* of the two series. In order to express the idea, I will formulate it as a thesis: "Given a cerebral state, there will ensue a definite psychic state." Or it may be stated thus: "A super-

human intelligence, watching the dance of the atoms of which the human brain consists and possessing the psycho-physiological key, would be able to read, in the working of the brain, all that is occurring in the corresponding consciousness." Or, finally, it may be put in this way: "Consciousness tells no more than what is going on in the brain; it only tells it in a different language."

There can be no doubt that the origin of this thesis is entirely metaphysical. It comes to us in a direct line from the Cartesian philosophy of the seventeenth century. Implicitly contained (with certain restrictions, it is true) in the philosophy of Descartes, accepted and pushed to extremes by his successors, it has passed from them, through the "medical philosophers" of the eighteenth century, to the psycho-physiology of today.

It is easy to understand why the physiologists should have accepted it without demur. In the first place they had no choice, for the problem came to them from metaphysics, and the metaphysicians proposed no other solution. And, secondly, it was in the interest of physiology to rally to it, and to proceed *as if* it were some day to give us a complete translation of psychical activity into physiological language. Only on some such supposition could physiology advance, pushing ever farther its analysis of the cerebral conditions of thought. It was, and it still is, an excellent principle of research, signifying that we ought not to

be too hasty in assigning limits to physiology, any more indeed than to any other scientific investigation. But the dogmatic affirmation of psycho-physiological parallelism is another matter altogether. It is no longer a scientific rule, but a metaphysical hypothesis. In so far as it is intelligible, it is the metaphysics of science as science was conceived in the time of Descartes, that is, in a purely mathematical framework. I believe that the facts, examined without prejudice and without the bias towards a mathematical mechanism, suggest a more subtle hypothesis concerning the correspondence between the psychic and the cerebral state. The latter only expresses the action which is pre-figured in the former; it marks out, so to say, the motor articulations of thought. Posit a psychical fact, and no doubt you therewith determine the concomitant cerebral state. But the converse is not true, for to the same cerebral state there may equally well correspond many different psychic facts. I have expounded this theory in *Matter and Memory,* and I will not repeat it here. The argument I propose to bring forward now is independent of it altogether. I am not going to substitute another hypothesis for that of psycho-physiological parallelism; what I want to show is that this hypothesis itself implies, in its usual form, a fundamental self-contradiction. It is, moreover, a self-contradiction full of instruction. In the perception that there is a self-contradiction we are given the clue to the direction in

which to seek the solution of the problem, at the same time that the mechanism of a most subtle metaphysical illusion is exposed. In pointing it out, we are not therefore engaged merely in critical and destructive work.

My contention is that the thesis rests on an ambiguity in the terms, that it cannot be stated in correct language without crumbling to pieces, that it implies a dialectical artifice, the surreptitious passing from one definite notation-system to an opposite notation-system without giving or taking notice of the substitution. Need I add that the fallacy is in one respect voluntary? It is suggested by the very terms in which the question is put; and it comes so naturally to our mind that we have no way of avoiding it except by forcing ourselves to formulate the thesis, *by turns,* in each of the two notation-systems of which philosophy makes use.

When we speak of external objects, we have to choose, in fact, between two notation-systems. We can treat external objects, and the changes they exhibit, as a system of *things* or as a system of *ideas.* And either of these two systems will work, provided we keep strictly to the one we have chosen.

Let us, first of all, try to distinguish the two systems with precision. When realism speaks of things and idealism of ideas, it is not merely a dispute about words; realism and idealism are two different notation-

systems, that is to say, two different ways of setting about the analysis of reality. For the idealist, there is nothing in reality over and above what appears to his consciousness or to consciousness in general. It would be absurd to speak of a property of matter which could not be represented in idea. There is no virtuality, or, at least, nothing definitely virtual; whatever exists is actual or could become so. Idealism is, then, a notation-system which implies that everything essential in matter is displayed or displayable in the idea which we have of it, and that the real world is articulated in the very same way as it is presented in idea. The hypothesis of realism is the exact reverse. When realism affirms that matter exists independently of the idea, the meaning is that beneath our idea of matter there is an inaccessible cause of that idea, that behind perception, which is actual, there are hidden powers and virtualities; in short, realism assumes that the divisions and articulations visible in our perception are purely relative to our manner of perceiving.

I am not questioning that profounder definitions could be given of the two tendencies, realist and idealist, such as they are to be found throughout the history of philosophy. I have myself indeed used the words " realism " and " idealism " in a somewhat different meaning. This is as much as to say that I have no particular liking for the definitions I have just given. They may characterize an idealism like

that of Berkeley and the realism opposed to it. They may also fairly well represent our ordinary notion of the two tendencies — the tendency of idealism to include the whole reality in what can be presented to our mind, the tendency of realism to claim to pass beyond what is presented to our mind. But the argument I am about to put forward is independent of any historical conception of realism and idealism. If any one is inclined to dispute the generality of my two definitions, I simply ask him to accept the words *realism* and *idealism* as conventional terms by which I intend to indicate, in the course of this study, two notations of reality, one of which implies the possibility, the other the impossibility, of identifying things with their ideas, that is with the presentations, spread out and articulated in space, which they offer to a human consciousness. That these two postulates are mutually exclusive, that consequently it is illegitimate to apply the two notation-systems at the same time to the same object, every one will agree. Now, I require nothing more for my present purpose.

I propose to establish the three following points: (1) If we choose the idealist notation, the affirmation of parallelism (in the meaning of equivalence) between the psychic state and the cerebral state is a self-contradiction. (2) If, on the other hand, we choose the realist notation, there is the same contradiction, but transposed. (3) The thesis of parallelism appears

consistent only when we employ at the same time, in the same proposition, both notation-systems together. That is to say, the thesis is inteligible only because, by an unconscious trick of intellectual conjuring, we pass instantly from realism to idealism and from idealism to realism, showing ourselves in the one at the very moment when we are going to be caught in the act of self-contradiction in the other. The trick, moreover, is quite natural; we are, in this case, born conjurors, because the problem we are concerned with, the psycho-physiological problem of the relation of brain and thought, itself suggests by its very terms the two points of view of realism and idealism,— the term "brain" making us think of a *thing,* the term "thought" of an *idea.* By the very wording of the question is prepared the double meaning which vitiates the answer.

First of all, then, we will place ourselves at the idealist standpoint, and consider, as an example, the perception of the objects which at any given moment occupy the visual field. These objects act on the visual centres in the brain through the retina and the optic nerve. There they bring about a modification of atomic and molecular dispositions. What is the relation of this cerebral modification to the external objects?

The thesis of parallelism is that the cerebral state

caused by the objects, and not the objects themselves, determines conscious perception, and therefore, so long as the cerebral state exists, all the objects perceived might, by a touch as it were of a magic wand, cease to exist, it would in no way alter what is going on in consciousness. But it is obvious that on the idealist hypothesis such a proposition is absurd. External objects are for the idealist images, and the brain is one of them. There is nothing in things themselves over and above what is displayed or displayable in the images. There is nothing, then, in the dancing about of cerebral atoms over and above a dance of atoms. Since this is all we have supposed to be in the brain, it is all that will be found there or that can be got out of it. To say that an image of the surrounding world issues from this image of a dance of atoms, or that the image of the one expresses the image of the other, or that given the one the other is also given, is self-contradictory, since these two images — the external world and the intra-cerebral movement — have been assumed to be of like nature, and since the latter image is, by the very hypothesis, a tiny part of the field of images presented, while the external world is that field in its entirety. To say that the cerebral movements contain virtually the image presentation which is the external world may indeed seem intelligible if we hold the doctrine that movement is something *un-*

derlying the idea of it, a mysterious power whose effect upon us is alone perceived. But this is evidently self-contradictory if we hold the doctrine that movement is itself idea, for it amounts to saying that a small patch of the field of presentation is the whole of presentation.

I can understand, assuming the idealist hypothesis, that cerebral modifications may be an *effect* of the action of external objects; they may be movements received by the organism which lead it to prepare the appropriate reactions. The nerve-centres,— images in the midst of images, moving pictures like all the other pictures,— contain movable parts which take in certain movements from outside and turn them into internal movements of reaction, either carried out or simply started. But, then, the work of the brain — a picture — is limited to receiving the influence of the other pictures and to marking out, as I said, their motor articulations. In this, and in this alone, is the brain indispensable to the remainder of our world-presentation, and that is why it cannot be injured without there resulting a partial or total destruction of that presentation. But it does not provide or exhibit the presentation, because, itself idea, it could not present the whole of the presentation unless it ceased to be a part of the presentation and became the whole. Formulated in strictly idealist language, the thesis of

parallelism would therefore have to be summed up in the self-contradictory proposition: *the part is the whole.*

But the truth is that *the philosopher unconsciously passes from the idealist to a pseudo-realist point of view.* He began by viewing the brain as an idea or picture exactly like all other ideas or pictures, encased in the other pictures and inseparable from them: the internal motion of the brain, being then a picture in the midst of pictures, was not required to provide the other pictures, since these were given with it and around it. But insensibly he comes to changing the brain and the intra-cerebral motion into *things,* that is to say, into *causes* hidden behind a particular picture and whose power extends far beyond what is presented. Whence this sliding from idealism to realism? It is favoured by many subtle fallacies; yet it would not be so smooth and easy were there not facts that seem to point in the same direction.

For, besides perception, there is memory. When I remember objects once perceived, the objects may be gone. One only has remained, my body; and yet the other objects may become visible again in the form of memory-images. Surely, then, it seems, my body, or some part of my body, has the power of evoking these images. Let us assume it does not create them; at least it is able to arouse them. How could it do this, were it not that to definite cerebral states cor-

respond definite memory-images, and were there not, in this precise meaning, a parallelism between cerebral work and thought?

The reply is obvious: in the idealist hypothesis it is impossible for an object to be presented as an idea in the complete absence of the object itself. If there be nothing in the object over and above what is ideally present, if the presence of the object coincide with the idea we have of it, any part of the idea of the object must be in some sort a part of its presence. The recollection is no longer the object itself, I grant. Many things are wanted before it can be that. In the first place, it is fragmentary, for usually the recollection retains only some elements of the primitive perception. Again, it exists only for the person who evokes it, whereas the object forms part of a common experience. Lastly, when the memory-image arises, the accompanying modifications of the brain-image are no longer, as in perception, movements strong enough to excite the organism-image to react immediately. The body no longer feels *uplifted* by the perceived object, and since it is in the *suggestion of activity* that the *feeling of actuality* consists, the object presented no longer appears actual: this is what we express by saying that it is no longer present. The fact is that, in the idealist hypothesis, the memory-image can only be a pellicle detached from the primitive presentation or, what amounts to the same thing,

from the object. It is always present, but consciousness turns its attention away from it so long as there is no reason for consciousness to consider it. Consciousness has an interest in perceiving it only when it feels itself capable of making use of it, that is to say, when the present cerebral state already outlines some of the nascent motor reactions which the real object (that is, the complete idea) would have determined: this beginning of bodily activity confers on the idea a beginning of actuality. But, then, there is no such thing as "parellelism" or "equivalence" between the memory-image and the cerebral state. For the nascent motor reactions portray some of the possible effects of the idea which is about to reappear, but they do not portray the idea; and as the same motor reaction may follow many very different recollections, it is not a definite recollection which is evoked by a definite bodily state; on the contrary, many different recollections are equally possible, and among them consciousness exercises a choice. They are subject to only one common condition — that of entering the same motor frame: in this lies their "resemblance," a term which is vague in current association theories, but which acquires a precise meaning when we define it by the identity of motor articulations. However, I shall not press this. I am content to say that in the idealist hypothesis the perceived objects are coincident with the complete and completely acting presen-

tation, the remembered objects with the same, but incomplete and incompletely acting, presentation, and that neither in the case of perception nor in the case of memory is the cerebral state equivalent to the presentation, for the simple reason that it is part of it. Let us turn, then, to realism and see whether it will make the thesis of psycho-physiological parallelism clearer.

Again, objects fill my visual field; my brain is in the midst of them; in my sensory nerve-centres are displacements of molecules and atoms occasioned by the action of external objects. From the idealist standpoint, I had no right to attribute to these internal movements a mysterious power of duplicating themselves with the idea of external things, for they were supposed to be in reality what they are in idea, and since, by the hypothesis, they present themselves as movements of certain atoms of the brain, they are movements of atoms of the brain and nothing else. But it is the essence of realism to suppose that behind ideas is a cause which is not idea. There seems no reason, then, why realism should not hold that the idea of external objects is implied in the cerebral modifications. According to some theories, the cerebral states are actually the creators of the ideas, which are then only their "epiphenomenon." According to other theories it is supposed, following the Cartesian distinction, that the cerebral movements are the

occasion, not the cause, of the apparition of conscious perceptions, or even that the perceptions and the movements are only two aspects of a reality which is neither movement nor perception. All, however, believe that to a definite cerebral state there corresponds a definite conscious state, and that the internal movements of the cerebral substance, considered by themselves, would reveal to one who should possess the cipher the complete detail of whatever might be going on in the corresponding consciousness.

But is it not at once clear that to consider the brain separately, and separately also the movement of its atoms, involves now an actual self-contradiction? An idealist has the right to declare any object isolable which gives him an isolated idea, because for him the object is not distinct from the idea. But realism consists precisely in the rejection of this view; it holds that the lines of separation which we draw in the field of presentation are artificial or relative; it supposes that beneath presentations there is a system of reciprocal actions and entangled potentialities; in short, it defines the object not by its entry into our presentation, but by its solidarity with the whole of a reality supposed to be unknowable. The more science investigates the nature of the body in the direction of its "reality," the more it sees each property of the body, consequently its very existence, melt into the relations in which it stands with the matter outside

it capable of influencing it. Indeed, the terms which reciprocally influence one another (whatever the names we give them: atoms, material points, centres of force, etc.) are only, for science, provisional terms; it is the reciprocal influence, or *interaction,* which is for it the final reality.

Now,— should I say to the realist,— you began by giving yourself a brain, and saying that objects external to it modify it in such a way as to raise up ideas of themselves. Then you did away with these objects external to the brain, and ascribed to the cerebral modification the power of providing by its own resources the idea of the objects. But, in withdrawing the objects which encase it, you are withdrawing also, whether you will or no, the cerebral state, for it owes to them all its properties and its reality. You *only preserve this cerebral state because you pass surreptitiously to the idealist notation-system, where you can posit as isolable by right what is isolated in idea.*

Keep to your hypothesis. External objects and the brain being compresent, the idea is produced. You ought to say that this idea is a function not of the cerebral state alone, but of cerebral state *and* the objects determining it, cerebral state and external objects now forming together one indivisible block. Here again, then, the thesis of parallelism that the cerebral states, detached from the external objects, are themselves alone able to create, occasion or at least express

the ideas of the objects, cannot be stated without falling to pieces. In strictly realist language it would be formulated thus: *A part, which owes all that it is to the remainder of the whole, can be conceived as subsisting when the remainder of the whole has vanished.* Or, still more simply: *A relation between two terms is the equivalent of one of them.*

Either the movements of atoms going on in the brain are just what they purport to be in our idea of them, or they are different. In the first hypothesis, they are perceived as they are, and whatever else we perceive is then another thing: between the cerebral movements and the rest of what we perceive there is, consequently, the relation of contained to container. This is the idealist standpoint. In the second hypothesis, the fundamental reality of the cerebral movements consists in their solidarity with all that is behind the totality of our other perceptions, and by the very fact of considering this fundamental reality we consider the whole of the reality with which the cerebral movements form an undivided system: which amounts to saying that the intra-cerebral movement, envisaged as an isolated phenomenon, has vanished, and that there can be no longer any pretence of making into the substratum of presentation, as a whole, a phenomenon which is only a part, and a part artificially carved out of the middle of it.

But the fact is that realism never does maintain

itself in a pure unalloyed state. We can posit the existence of the real in general behind the ideas; but as soon as we begin to speak of particular reals, we must, whether we will or no, assume that things more or less coincide with the ideas we have of them. In front of the hidden background which he assumes to be reality itself, and where everything must be implied in everything, since it is behind space, the realist sets side by side, just as the idealist does, the distinct and explicit ideas or pictures which make up the whole of presentation. Realist when he posits the real, he becomes idealist directly he affirms anything concerning it, because realist-notation, when applied to explanations of detail, can hardly consist in anything else but inscribing, beneath each term of idealist-notation, a *mark* which indicates its provisional character. Be it so: but then, what we have just said of idealism now applies to realism which has taken up idealism on its own account. And therefore, by whatever name we denote the system, to say that cerebral states are the equivalent of perceptions and memories comes always to affirming that the part is the whole.

Comparing the two systems, we see that it is essential to idealism to stop at what is displayed and spread out in space and at spatial divisions, whilst realism regards the display as superficial and the divisions as artificial: realism assumes behind the juxtaposed ideas a system of reciprocal actions, consequently a

mutual *implication* of the pictures or ideas. Now, as our knowledge of matter can never get clean away from space, and as the reciprocal implication with which realism deals, however deep it be, can never become extraneous to space without becoming extraneous to science, realism in its explanations can never get beyond idealism. We are always more or less in idealism (in the sense defined) when we have to do with knowledge or science: were we not, we should not even think of taking isolated parts of reality and relating them to each other,— which is the very essence of science. The hypothesis of the realist is therefore here only an ideal, whose purpose is to remind him that he has never gone deep enough down in his explanation of reality, and that he must discover more and more fundamental relations between the parts of the real which to our eyes are juxtaposed in space. But the realist cannot help hypostasizing this ideal. He hypostasizes it in the ideas or pictures, set side by side, which for the idealist are reality itself. These ideas become therefore for the realist so many *things* — that is to say, reservoirs of hidden potentialities — and he can now think of the intra-cerebral movement (no longer simple ideas, but things) as enclosing potentially the whole complete world as idea. In this consists his affirmation of psycho-physiological parallelism. He forgets that he had placed his reservoir outside the world of idea and not within it, out of

space and not within it, and that in any case his original hypothesis consisted in supposing reality either undivided or articulated in itself otherwise than it is in idea. In making a particular part of the world as reality correspond to each part of the world as idea, he articulates the real as he articulates the idea, he displays reality in space, and abandons his realism in order to enter into idealism, in which the relation of the brain as idea to the rest of the world as idea is clearly that of the part to the whole.

You began by speaking — should I say again to the philosopher — of the brain such as we see it, such as it stands out in the midst of the presentation: so you assumed it to be a part of presentation, an idea, and you were in idealism. There, I repeat, the relation of the brain to the rest of presentation can only be the relation of part to whole. Thence, all of a sudden, you have fled to a reality supposed to *lie beneath* the presentation. Very good: but such reality is subspatial, which amounts to saying that the brain is no more an independent entity. What you have to do with now is the totality of the real, in itself unknowable, over which is spread the totality of the presentation. You are now, indeed, in realism; and no more in this realism than in the idealism of a moment ago are the cerebral states the equivalent of the whole of presentation: it is — I must repeat it — the whole world of things which is again implied (but, this time,

concealed and unknowable) in the whole of perception. But lo! taking the brain apart and dealing with things separately, you are actually continuing to decompose and recompose reality along the same lines and according to the same laws as presentation, which means that you no longer distinguish the one from the other. Back you are, then, in idealism; there you ought to remain. But not at all! You do indeed preserve the brain as it is given in presentation, therefore as an idea, but you forget that if the real is thus spread out in the presentation, if it is *extension* and not *tension,* it can no longer compress within itself the powers and virtualities postulated by realism; unheedingly you erect the cerebral movements into the equivalent of the whole of presentation. You are therefore oscillating from idealism to realism and from realism to idealism, but so quickly that you do not perceive the see-saw motion and you think yourself all the time astride the two systems joined into one. This apparent reconciliation of two irreconcilable affirmations is the very essence of the thesis of parallelism.

I have tried to dissipate the illusion. It is not likely that I have entirely succeeded, because so many sympathetic ideas are grouped around the thesis of parallelism and protect it. Some of these ideas were born of the thesis itself; others, on the contrary, preceded it and were the instigators of the illegitimate union which gave it birth; others again, with no blood rela-

tionship, have modelled themselves on it by constantly living beside it. All form round it today an imposing line of defence, which, when broken through on one point, calls up renewed resistance on another. I may specify some of these in particular.

1. There is the implicit (I might even say the unconscious) hypothesis of a *cerebral soul,* I mean the hypothesis that the world as idea is concentrated in the cortical substance. As our presentation-world seems to accompany us when our body moves, we reason that there must be, inside that body, the equivalent of the world-presentation. The cerebral movements are thought to be this equivalent. Consciousness, then, can perceive the whole of the universe without putting itself out of the way; it has only to range within the limited space of the cerebral cortex,— a *camera obscura* where a miniature reproduction is to be found of the whole world.

2. There is the idea that all causality is mechanical and that there is nothing in the universe which is not mathematically calculable. Then, as our actions result from our ideas (past as well as present), we must, under pain of admitting a breach in mechanical causality, suppose that the brain, from which the action is started, contains the equivalent of perception, memory and even thought itself. But the idea that the whole world, including the living beings in it, can be treated as the subject of pure mathematics, is an *a priori* view

of mind which goes back to the Cartesians. We may express it in modern terms, we may translate it into the language of present science, we may call in support of it an ever-increasing number of actual observations (the idea itself has prompted us to make them) and so attribute to it an experimental origin, the effectively measurable part of reality remains limited none the less, and the law, regarded as absolute, retains the character of a metaphysical hypothesis, which it already had in the time of Descartes.

3. There is the idea that all that is required, in order to pass from the idealist standpoint of *image-presentation* to the realist standpoint of *thing in itself*, is to substitute for the pictorial presented image that same image reduced to a colourless design and to the mathematical relations of its parts to one another. Hypnotized, so to speak, by the void which our mental power of abstraction is creating, we accept the suggestion that some, I know not what, marvellous significance is inherent in the mere motion of material points in space, that is to say, in an impoverished perception. We endow this blank abstraction with a virtue we should never have thought of bestowing on the concrete image, far richer, given in our immediate perception. But the truth is that we have to choose between the conception of reality, which represents it spread out in space and consequently in idea, thus considering it as altogether actual or ready to become

so, and the conception of reality which represents it as a reservoir of potentialities shrunk into itself, so to say, and outside space. No work of abstracting, of eliminating,— in short, of impoverishing,— performed on the first conception brings us any nearer to the second. Whatever you say concerning the relation of the brain to the idea from the standpoint of a pictorial idealism, which takes immediate presentations as they are, coloured and living, appplies *a fortiori* to an abstruse idealism which reduces them to their mathematical skeleton, and which, by emphasizing the spatial character and reciprocal externality of the ideas, only shows more clearly how impossible it is for one of them to include all the others. Because, by rubbing extensive presentations against one another, you have blotted out the qualities which differentiated them in perception, you have not thereby advanced one step towards a reality which you assumed to be tension, not extension, and consequently so much the more real as it is more inextensive. As well might we imagine that a worn-out coin, by losing the precise mark which denotes its value, had gained an unlimited purchasing power.

4. Lastly, there is the idea that if two wholes are solidary, each part of the one is solidary with a definite part of the other. And so, as there is no state of consciousness without its cerebral accompaniment, as a variation of this cerebral state does not take place

without bringing on a variation of the conscious state (although the converse is not necessarily true in all cases), as an injury which interferes with cerebral activity may entail an injury to conscious activity, we conclude that to any fraction whatsoever of the state of consciousness there corresponds a definite part of the cerebral state, and then that one of the two terms can be substituted for the other. As though we had the right to extend to the detail of the parts, thus supposing them to be related each to each, what has only been observed or inferred of the two wholes, and so convert a relation of solidarity into a relation of equivalent to equivalent! The presence or absence of a screw may decide whether or not a machine will work: does it follow that each part of the screw corresponds to a particular part of the machine, and that the equivalent of the machine is the screw? The relation of the cerebral state to the idea or presentation may very well be that of the screw to the machine, that is, of the part to the whole.

These four ideas themselves imply a great number of others, which it would be interesting to analyse in their turn, because they would be found to be, in a kind of way, so many harmonics the fundamental tone of which is the thesis of parallelism. In this study I have only tried to bring to light the contradiction inherent in the thesis itself. Just because the consequences to which it leads, and the postulates which it contains,

cover, so to say, the whole domain of philosophy, it has seemed to me that this critical examination is incumbent on, and may serve as the starting-point of, a theory of the mind considered in its relation to the determinism of nature.

INDEX

INDEX

Abnormality, defect or excess, 151
Albès, 149
Anjel, 139, 142
Apraxia, 204
Arnaud, 136, 137, 143
Artigues, 112
Attention, sensory, 190
Attention to life, 59, 60, 147, 153, 178

Bagley, 206
Bastian, 217
Bélugou, 140
Berkeley's idealism, 235–236
Bernard-Leroy, 135, 146, 171
Binet, Alfred, on chess-playing, 197
Bonatelli, 139
Bonnet, Charles, 50
Bourdon, 140
Bourget, Paul, 181
Brain, its functions, 10; an organ of choice, 13–14; an organ of attention to life, 59

Cabanis, 50
Cartesian metaphysics, 50
Cattell, 206
Cerebral duality, hypothesis of, 142–143, 241
Cerebral soul, idea of, 251
Certainty as limit of probabilities, 5–7
Chess-players' memory, 197
Claparède, theory of "disinterest," 126
Comte, Auguste, 36
Consciousness, coextensive with life, 17; primary functions, 8; relation to brain, 11; signifies memory, 8, 68
Contemporaneous formation of perception and memory, 157
Coriat, 137
Creative imagination, 213
Crossing of matter by consciousness, 23

Darwin, 23
Delage, 131
Depersonalization, 134–135
Descartes, 49, 232, 233
Dewey on psychology of effort, 215
Disinterestedness in life, 95, 116
Disinterestedness of the dream, 124–126
Dream-stuff, 105
Dream a counterfeit of insanity, 155

Dream caused by barking dog, analysis of, 124
Dream of deep slumber, 132
Dromard, 149
Dugas, 135
Dynamic scheme, 196

Enfeebled impulse, 183
Epiphenomenon, 243
Equivalence of cerebral and mental, 45, 48, 233
Fallacy of substituting the abstract for the concrete, 83
Forel, 137
Fouillée, 143
Freud's *Traumdeutung,* 131
Future life, 35

Galileo, 49, 98
Goldscheider and Müller's experiments, 119, 206
Gradual recall, mechanism of, 193
Grasset, 140, 142

Helvetius, 50
Hervey, Marquis of, 105, 115
Heymans, 148, 149, 181
Höffding, 140
Huxley, 1

Idealism as a notation-system, 234
Illusion that memory is later than perception, 157–158
Images and ideas as halts in thinking, 55
Inattention to life, 184
Inhibitory mechanisms, 153
Instability of the dream, 128
Instantaneous recall, mechanism of, 189
Instinct and intelligence, 25
Invention, the effort of, 211

James, William, 78, 141, 195
Janet, Dr. Pierre, 137, 148
Jensen, 137, 138, 139, 143, 172
Joy the sign of creation, 29
Juridical method in Psychical Research, 80

Kepler, 49, 98
Kinæsthetic images, 219
Kräpelin, 136, 137, 139, 141

Ladd, Prof, G. T., 105
Lalande, Prof. A., 144, 171
Lamarck, 23
La Mettrie, 50
Lapie, 140
Leibniz, 8, 50, 95
Le Lorrain, 140
Léon-Kindberg, 148
Lewes, G. H., 209
Light-sensation in dreams, 106
Lines of facts, 7
Lodge, Sir O., 34

Marie, Dr. Pierre, 90
Materialist hypothesis, 40–43
Matter, as necessity, 17; as necessary to the realization of life, 28

Maury, Alfred, 105, 108, 128
Mechanical causality, 251
Mechanism of living action, 18, 44
Memory, its relation to the brain, 62 ff.; how formed, 158, 163; in dream, 116; a mirror-image of perception, 165, 166
Memory of the present, why concealed from consciousness, 175
Mnemonics, 194
Monoideism, 224
Myers, F. W. H., 144
Nature, from the standpoint of art, 30; from the moral standpoint, 31

Newton, 98

Oscillation of attention, 209, 220

Pantomime, brain as organ of, 53, 94, 95
Parallelism, hypothesis of, 91, 237; metaphysical origin of, 48–50
Pascal, 72
Paulhan, 212
Perception in the waking state and in the dream state, 118 ff.
Pick, 136, 137
Piéron, 143
Pillsbury, 206
Plato, 47
Plotinus, 117
Precipitation of dream-images, 130
Prejudice against psychical science, 76
Prendergast, 192, 200
Preperception, 209
Present as mathematical instant, 8
Problems, the great, 3–4
Progressive aphasis, 66
Psychasthenia, 138

Rapidity of dreams, 129
Reading experiments, 119, 206
Realism as a notation-system, 235, 243
Realist and idealist standpoints compared, 247
Ribot, 141, 144, 187, 211
Robert, W., 131
Robert Houdin, 190–193
Rolandic zone, 54

Sander, 139, 140
Scheme and image, 201
Scherner, 112
Schopenhauer, 112
Sensory attention, 187
Simon, Max, 108, 111
Sleep, psychological condition of, 122
Social life the goal of evolution, 33
Solidarity does not imply equivalence, 253
Spinoza, 50
Stevenson, R. L., 114

Survival, 72, 96–97
Systems of philosophy, 1–2

Taine's theory of chess-player's memory, 197
Tartini's Devil's Sonata, 113
Telepathy, 79–80
Tensions of duration, 20
Tension and tone, 147
Tissié, 107

Unforeseeableness, 17

Veil on the past, 71
Visual sensations condense a history, 20

Wigan, 143
Witasek, 188
Word-memory, 62, 63, 89, 90

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